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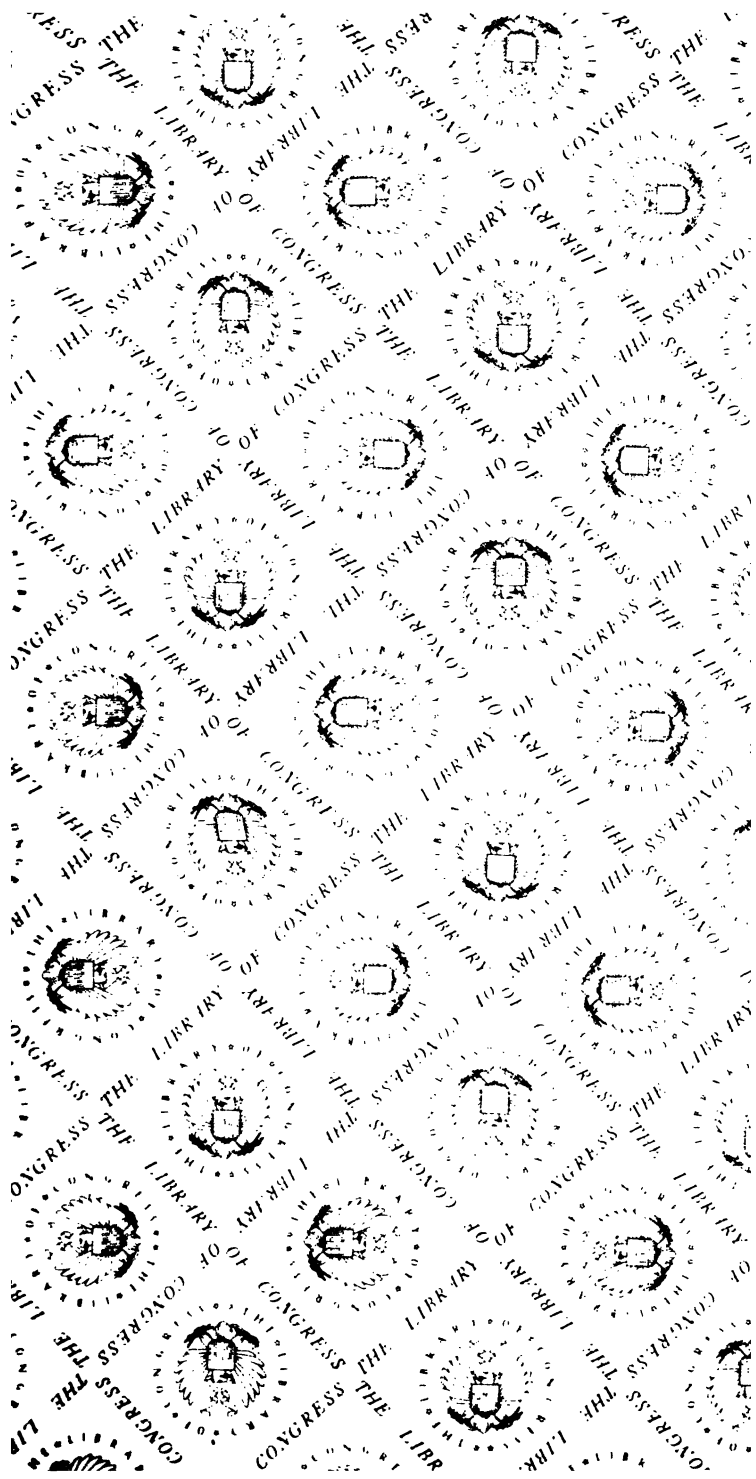
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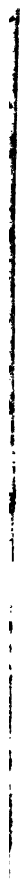
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**JOURNAL**  
**OF THE**  
**BATH AND WEST AND SOUTHERN**  
**COUNTIES SOCIETY.**

**FOURTH SERIES.**

**VOL. IV.**

**1893-94.**



**WORK AND LEARN.**

**LONDON :**  
**EDWARD STANFORD, 26 & 27, COCKSPUR STREET,**  
**CHARING CROSS, S.W.**

**1894.**

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"He that goes about to forward agricultural improvement must begin by finding out the true reasons of what is called routine, or the 'custom of the country.' It sometimes happens that these reasons are only accidental, and then you may dismiss them fearlessly; but often it turns out that every-day practice rests on a solid foundation of facts; and then if you make an onslaught on local prejudices, they will be sure to beat you.

"The true course for the agricultural improver is, to take one step at a time, to gain a clear insight into facts by experience, not to try to go too fast, and to trust to the work of time.

"If practice, which sets up to do without theory is contemptible, theory without practice is foolhardy and perfectly useless."—*From the Rural Economy of England, Scotland, and Ireland*, by LEONCE DE LAVERGNE.

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JOURNAL  
OF THE  
BATH AND WEST AND SOUTHERN COUNTIES  
SOCIETY.

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**Proceedings of the Society.**

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GLOUCESTER MEETING, 1893.

*I.—Report of the Council presented to the Annual General  
Meeting of Members held on June 2, 1893.*

THE Council, in presenting their Annual Report, can once more congratulate the Members upon the general prosperity of the Society.

Owing in a great measure to the successful financial result of the Swansea Meeting, the Council have been enabled to add 1500*l.* to the funded capital.

During the past year the Society has lost, from death and other causes, an unusual number of old supporters, and the membership roll consequently stands at 1273 as against 1310 last year.

Two extraordinary vacancies in the Council have been filled up by the election of Sir Alexander Acland Hood, Bart., M.P., and Mr. F. G. Farwell.

During the past year the Society has continued and extended its efforts to promote practical education in Dairying through the medium of its Schools, and its activity in this direction has been stimulated by the calls which have been made upon it by various public bodies.

Under an arrangement with the Somerset County Council, one of the Society's travelling Butter Schools is continuing its visits to various centres in the county, and a fixed Cheese School has been opened at Butleigh near Glastonbury.

Travelling Butter Schools have also been provided by the Society, in response to applications from County Councils, for Kent, Dorset, and Glamorganshire, and one will shortly be opened in Devonshire.

An experimental department, for the purpose of conducting skilled and systematic investigations with reference to Dairying, has again been attached to the Cheese School, the experience of previous years having fully satisfied the Committee of its value. Particulars of the results obtained have been published in the recent issue of the Society's Annual Journal.

The Board of Agriculture has once more borne testimony to the utility of the work carried on by the Society's Dairy Schools by awarding a grant in aid of 400*l*. Such a recognition has been a great encouragement, and has enabled the Council to engage more actively in the work than it otherwise could have done.

The Society's Field Experiments of 1892 were threefold, having for their object:—

1. To ascertain the effect on the succeeding corn crop of the manures used upon the mangold plots of 1891.
2. To ascertain what artificial manures can be used with advantage upon old pasture.
3. To ascertain the effect of salt as an addition to nitrate of soda for top-dressing wheat and barley.

These have been successfully carried out, and the results which have been obtained are particularised in the recent issue of the Society's Annual Journal.

The Board of Agriculture has been pleased to recognise the importance of this work by a grant in aid of 150*l*.

For the current year experiments are being conducted with a view to the renovation of pastures.

The present exhibition of Stock is larger than usual, and the total number of entries in the various departments of the Show has never been exceeded.

The Council have gratefully to acknowledge the receipt of Special Prizes amounting to 400*l*., from the Gloucester Local Committee, and others of varying amounts from the Shire Horse Society, the Hunters' Improvement Society, the English Jersey Cattle Society, the English Guernsey Cattle Society, and the Shropshire Sheep Breeders' Association.

The Council have accepted an invitation to hold the Annual Meeting next year at Guildford.

They have much pleasure in recommending that the Earl of Onslow be elected President for the ensuing year.

The Council have the gratification of announcing that H.R.H. the Duke of York has kindly consented to honour the Society by becoming a Vice-President. In nominating H.R.H. to the Office, the Council feel assured that his identification with the Society will be regarded with the liveliest satisfaction by every Member.

*Annual General Meeting of Members on June 2nd, 1893. 3.*

The Council recommend that the retiring President (Lord Fitzhardinge) and the Duke of Somerset be also elected Vice-Presidents of the Society.

They beg to recommend the following for election as Members of Council for the years 1893-95, in room of those retiring by rotation :—

EASTERN DIVISION.—J. K. D. Wingfield Digby, M.P., T. Dyke, C. L. F. Edwards, F. G. Farwell, Sir A. Acland Hood, Bart., M.P., H. P. Jones, E. C. A. Sanford, A. C. Skinner, and Rev. L. E. Sweet.

WESTERN DIVISION.—C. T. D. Acland, V. P. Calmady, F. W. Dymond, Col. W. Leir, Col. W. D. Naper, E. J. Sanders, A. O. Sillifant, Col. R. Trood, and Sir W. H. Walrond, Bart., M.P.

SOUTHERN DIVISION.—W. Ashcroft, Capt. W. J. Casberd Boteler, H. M. Cobb, H. M. Cundall, F.S.A., F. Gill, C. Pain, J. S. Parker, R. A. H. Seymour, and M. J. Sutton.

WITHOUT REFERENCE TO DISTRICT.—Capt. J. C. Best, W. J. Brown, W. L. Chorley, W. H. Fowler, G. Gibbons, and H. W. Taylor.

The Council desire to express their thanks to the Mayor of Gloucester, the Members of the Local Committee, and the inhabitants of the city and neighbourhood generally, for the cordiality with which they have welcomed the Society, and the energy they have displayed in promoting the success of the Meeting.

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*II.—Report on the Proceedings at the Gloucester Meeting, 1893.*

By R. HENRY REW.

IN 1893, as in 1892, the Society broke new ground, and visited a place at which it had not previously held its Show. Gloucester lies quite in the heart of the Society's area, and it was somewhat remarkable that circumstances had not earlier afforded an opportunity for the Society to visit it. This was the forty-second Show held since the Society became itinerant in 1852, and during that period twenty-nine different towns in the Society's district have been visited.

Inasmuch as three of the Society's Shows have been held at Bristol—all of them on the northern side of the Avon—it cannot be said that this was its first visit to Gloucestershire. The county is, agriculturally, one of the most interesting in the Society's district, containing as it does a considerable diversity of farming. Rather more than half of its area is under the plough. It has long been one of the strongholds of the Short-horn breed of cattle, some of the most famous herds in the

kingdom being located within its borders. The Cotswold hills, with their ancient and celebrated breed of sheep, have a world-wide fame among agriculturists. The rich pastures and grazing lands of its vales are noted for the production of butter and (though not perhaps to so great an extent as formerly) of cheese. Fruit-farming has established in recent years a firm footing in the county, and there is a small acreage under hops.

The Showyard at Gloucester was situated at Podsmead, nearly two miles from the centre of the city. It comprised about forty acres, and, being almost square, was easily capable of symmetrical and compact arrangement. Though the site could not compare for picturesque surroundings with that at Swansea and some other places, it was in every respect exceedingly well adapted for the purposes of the Show.

The Show was one of the largest ever held by the Society. In almost every section it was above the average, the space devoted to implements being especially well filled. There was not a very large proportion of novelties in the implement department; but for size and completeness, as a comprehensive display of the latest and most approved appliances and machines for agricultural use, the Show has seldom, if ever, been surpassed.

#### THE OPENING.

The formal opening of the Show took place inside the entrance at 10 A.M. on Wednesday, May 31, the Mayor of Gloucester (Mr. J. A. Matthews) performing the ceremony. The Mayor was accompanied by the Deputy-Mayor (Alderman Platt), the City High Sheriff (Mr. T. W. Hibbard), the Deputy Mayor of Cheltenham (Alderman Wethered), and a large number of the aldermen, members, and officials of the Corporation of Gloucester. They were met at the entrance by the President of the Society (Lord Fitzhardinge), and a considerable number of Vice-Presidents, Stewards, and Members of Council. The Secretary having read the resolution of the Council inviting the Mayor to open the Exhibition, his worship in well-chosen terms cordially welcomed the Society to Gloucester, and concluded by formally declaring the Exhibition opened. The President, in response, expressed the Society's indebtedness both to the Mayor for his services on that occasion, and to the citizens generally for the heartiness of their reception.

#### THE ATTENDANCE.

It is a well-founded maxim with those who have experience of Shows, that only large centres of population produce large

"gates;" hence, although Gloucester is most conveniently situated for access by railway, the total number of visitors during the week was only 54,640, though the average attendance for the preceding ten Shows has been 58,474. While the total did not come up to the average, it exceeded the records of such places as Newport, Exeter, and Brighton, and so cannot be considered unsatisfactory.

The weather, generally speaking, was favourable, and for the most part, indeed, characterised by the tropical heat which has rendered the season of 1893 memorable.

### THE LIVE STOCK.

The following is a statement of the entries in the various sections of live stock at Gloucester and at the four preceding Shows :—

	Exeter, 1889.	Rochester, 1890.	Bath, 1891.	Swansea, 1892.	Gloucester, 1893.
<b>HORSES :—</b>					
Agricultural .. .. .	31	29	52	31	55
Hunters, Hacks, Ponies, and Harness .. .. .	118	28	121	70	99
	— 149	— 57	— 173	— 101	— 154
<b>CATTLE :—</b>					
Devons .. .. .	64	19	53	25	30
Shorthorns .. .. .	38	38	64	47	71
Herefords .. .. .	56	46	37	37	38
Sussex .. .. .	48	49	35	20	23
Jersey .. .. .	152	126	226	118	133
Guernsey .. .. .	68	82	69	25	59
Black Welsh .. .. .	..	..	..	24	..
Kerry .. .. .	..	..	..	..	20
Dairy .. .. .	2	11	..	2	5
Butter Test .. .. .	16	8	20	19	10
	— 444	— 379	— 504	— 317	— 389
<b>SHEEP .. .. .</b>	182	231	234	249	261
<b>Pigs .. .. .</b>	78	85	127	113	151
<b>POULTRY .. .. .</b>	463	450	429	422	490

### HORSES.

**Shires.**—For the first time the Society provided separate classes for Shire horses, as distinct from other horses used for agricultural purposes. Hitherto all "heavy" horses had to compete together, and this latterly has been felt to be inconvenient. The large majority of farm horses in the Society's district are undoubtedly Shire-bred, but there are some Clydesdales and a few Suffolks, as well as many which do not come under any of the

recognised categories. The provision of five classes for Shire horses exclusively had a highly satisfactory result by bringing out a number of good animals, and one of the judges (Mr. Freshney) reported that it was the best display of Shire horses he had seen at a Bath and West Show, though he observed that the entries were small, considering the value of the prizes offered. The Society offered 136*l.*, and this was supplemented by 40*l.* given by the Gloucester Local Committee, and a gold medal given by the Shire Horse Society.

**Other Agricultural Horses.**—Only 18 entries were made in these classes, the majority being Clydesdales.

**Light Horses.**—Mr. Robson, one of the judges, reported on this section as follows:—

**Hunter Mare or Gelding, foaled in 1889.**—The animals in this class were a good lot, but the winner, "*Knight Errant*," was far in advance of any of his competitors, showing great style and quality, though a trifle high in the leg.

**Hunter Filly or Gelding, foaled in 1890.**—The competition between first and second was very keen, and the animals throughout were a credit to their owners.

**Hunter Filly or Gelding, foaled in 1891.**—The judges slightly differed in this class, but ultimately decided in favour of Mr. Canning's chestnut gelding over Messrs. Bradburne's bay gelding "*Land Mark*," who will very probably turn the tables upon his successful rival next time they meet.

**Hunter Filly or Colt, foaled in 1892.**—A creditable class.

**Hunter Mare and foal, or in foal.**—A very good class, the winner—"*Princess*"—being a nice, short-legged, level mare, full of quality; the second prize being awarded to a roomy weight-carrying animal; the third to a good old veteran, whose owner described her as thorough-bred and 21 years old. The Reserve card was given to a very useful grey.

**Hacks.**—CLASS 17, for *Mare or Gelding over 14 hands*, contained the finest mover in England, which made "*Lady Isabella*" an easy winner, whilst the second, third, reserve, and two commended animals were very creditable competitors.

**Hack Mare or Gelding not over 14 hands**—was a very strong class, the competition being somewhat close.

In the Class for **Pony Mare or Gelding not over 13 hands**, the numbers were few, but the quality good.

The Class for **Harness Mare or Gelding over 14 and not over 15·2 hands**—was especially good, containing the almost unbeaten "*Nelly*," whose hind-leg action has improved. "*Moonlight*" is also a nice, free-moving mare, and was placed second; whilst a very pretty brown mare, "*Mermaid*," deservedly obtained the third prize.

In the **Harness Mare or Gelding not over 14 hands**—"The Don" was placed first, being closely pressed by "*Dorothy Derby 2nd*," a very promising 3-yr. old, who will, when a little better broken to harness, very probably turn the tables upon her successful rival. The third prize and reserved animals in this class are a credit to their owners.

## CATTLE.

The entries in the cattle classes numbered 389, which was somewhat below the average of recent years. This was partly to be accounted for by the fact that the Jersey section, although it comprised 133 animals, has been at one or two of the recent Shows still more numerous filled. It cannot be said that there was really any marked falling off in the representation of any of the leading breeds. The special features of the Show were the remarkable display of Shorthorns, and the appearance, for the first time, of the attractive little "Kerries" in the Society's showyard.

**Devons.**—Considering the distance from their native pastures, the "Rubies of the West" made a very creditable display. They mustered 30 entries in the seven classes, all of them coming from Somerset, Devon, or Cornwall. At Swansea there were only 25, but in the preceding year at Bath they numbered 53. The judges in their Report described the old bulls as especially good, and the two-year-old bulls as comprising good, useful animals. The yearling bulls were very promising, especially the first prize one, which the judges thought would be most likely heard of again as a prize winner. There were only two cows, but both were very superior, and the same remark was applied to the three-year-old heifers. The yearling heifers, though only two in number, were both so good that a second prize was recommended, and the heifer calves were an exceedingly good lot of young animals.

**Shorthorns.**—Gloucestershire is well known as one of the strongholds of the Shorthorn breed, and the 71 entries which came before the judges well maintained the reputation of the district. The judges, Messrs. Matthew Savidge and R. L. Angas, reported as follows:—

In CLASS 29—*For Bulls calved in 1889 or 1890*—Mr. Brierley's well-known bull "*Stanley*" was decidedly the best animal, as, although perhaps a trifle plain in his hind quarters, he had much more of a Shorthorn appearance and character about him than any of the other competitors in this class. "*Blair Athol*," a bull remarkable for his substance and thickness, was deservedly second; and "*St. Clair*," who seemed short of hair, was placed third.

In CLASS 30—*For Bulls calved in 1891*—Mr. Stratton's "*Hornblower*" was a long way ahead of all others. He has very great substance and a grand coat, though he is, perhaps, rather loosely put together at the back of the shoulders; otherwise, he is a bull of extraordinary merit. He afterwards was awarded the Champion Prize for the best male Shorthorn in the Show. Mr. Willis was second in this class with a fairly well-grown animal, but with strongish horns and rather light through his heart; otherwise a level young bull. This was a good class with one or two exceptions.

In CLASS 31—*For Bulls calved in 1890*—Mr. Willis was deservedly first with a nice level promising calf, and he also secured the third with a hairy calf of good character, but a trifle narrow throughout. Mr. Handley's "*Royal*"



*Harbinger*" was a good second. Except the prize-winners, there were no animals of especial merit in this class.

CLASS 32—*For Cows in Milk or in Calf*—was, excepting the winners, a poor one. Mr. Brierley's "*Grace Darling*" won easily, and Mr. Harrison's "*Forest Queen*" made a good second. Mr. Stevens's "*Crocea 19th*" showed great "dairy merit," but was in no state to show; otherwise, she is a really useful animal.

CLASS 33—*For Heifers in Milk or in Calf*—was a very good one, and included animals of great merit. Mr. Brierley's "*Rosedale Georgie*," awarded the first prize, is a good animal, and shows signs of becoming an excellent dairy cow, as well as a handsome Shorthorn. Mr. Willis's "*Golden Mary*" was a good second, and except that she is plain about her rump-ends, she is an extraordinarily good animal. Her head, shoulders, back, and loins are excellent. The third was also a promising heifer.

CLASS 34—*For Heifers calved in 1891*—was an extremely good class, many of the animals being of the highest merit. Here, again, Mr. Stratton was successful, winning very easily with his beautiful heifer, "*Timbrel 23rd*," which afterwards won the Champion Prize as the best female Shorthorn. The second prize went to Mr. Willis's good heifer "*Jessamine*," a very beautiful animal, and the third to Mr. Harrison's "*Warfare*," the reserved heifer, belonging to Mr. Brierley, being a most promising animal.

CLASS 35—*For Heifers calved in 1892*—brought out some half-dozen very promising animals, the first prize going to a wealthy short-legged heifer belonging to Lord Bute. Mr. Willis secured second prize with his nice red heifer, "*Sensation*," who easily beat her companion, "*Jilt*."

**Herefords.**—The number of Herefords was rather disappointing, considering the proximity of the Show to their native county. The exhibitors of this breed seem to be falling off somewhat in enterprise, for it is remarkable that whereas at Exeter in 1889 there were 56 entries, and 46 at Rochester in 1890, there were at Gloucester only 38, notwithstanding the far shorter distance which they had to travel. The following Report was made by the judges, Messrs. John White and J. P. Terry:—

The Bull classes were not very numerously represented, but we found in them some very good specimens of the breed, notably, the winner in the elder class, Mr. Arkwright's "*Rose Cross 2nd*," an especially deep, good-fleshed animal. Lord Coventry's "*Corydon*" (Class 37), was also very level and well-fleshed.

The Cows and Heifers were a better lot than the male animals, and we had some difficulty in placing the first and second prizes in Classes 39, 41, and 42. In Class 40 we found that wonderfully good animal "*Perilla*," which was so successful in last year's shows; she has fully earned the reputation that was then predicted for her. Class 41—yearling heifers—we highly commended throughout, No. 276 being an especially good and square animal. Class 42—heifer calves—was represented by 14 exhibits, and as all of them were of special merit, we recommended that a fourth prize should be given; any one of the first four being worthy of a first prize in any Showyard.

**Sussex.**—There were only 23 entries of Sussex cattle, although this was more than in the previous year. It was scarcely to be

expected that so far from home they would come out in any great force. The judges, Messrs. Agate and Heasman, observed that, though the classes were not large, there were some good representative animals of the breed. In the old bull class they considered the first and second prize animals to be two grand old bulls, and the class altogether a good one. The first prize yearling bull the judges described as "a grand young bull of rich colour and perfect type," the second being a massive, good animal, and the reserve bull having several good points. The heifer classes did not call for any special remark, but the first prize animal in the yearling heifer class was described as "of good substance and by far the best," and the first prize heifer calf as "very handsome and promising." The second prize heifer calf was also a very good one.

**Jerseys.**—The judges of Jerseys, Messrs. W. Ashcroft and A. W. Byron, congratulated the Society on the number and quality of the exhibits in this section. The total number of entries was 133, being 15 more than at Swansea, but 19 less than at Exeter. The judges handed in a detailed Report as follows:—

**CLASS 50—For Old Bulls calved in 1889 or 1890**—brought only five into the ring, out of which No. 321, a level animal with good outline and well-marked escutcheon, was placed first; and No. 319, a rich bull with fine horn, well teated, and a good handler, came second, but was not quite so good over his hind-quarters as the first prize-winner. Third prize, No. 322, was rather heavy in head and horn and a little coarse at the setting on of the tail.

**CLASS 51—For Bulls calved in 1891**—was better filled. No. 324, which afterwards took the champion prize as best male Jersey—a very taking lengthy bull—was placed first. No. 323, the second prize, had a fine neck and shoulders but rather unevenly set-on tail; No. 326, rich but heavy in head and horn, came third. A nice quality dark bull, No. 332, took Reserve number, and No. 328, a good, somewhat nervous bull, who did not show himself well, was very highly commended. No. 329, a long dairy-like bull, with remarkable thigh escutcheon, but too much broken coloured for a bull, was commended.

**CLASS 52—For Bulls calved in 1892**—was not a very good Class. There was not much to choose between Nos. 347 and 344 for first and second place, and but for a slight unevenness behind the chine in the latter, they might have changed places. Third prize, No. 329, was a lengthy young bull, who will probably improve as he grows older; and a dark rich animal, No. 343, with well placed false teats, was Reserve.

**CLASS 53—The Old Cow Class**—was, on the whole, perhaps the best Class we had to judge, nearly every cow showing good dairy points as well as beauty in a breed point of view. No. 374, who took premier honours and champion prize as the best Jersey female, was a fine long, level, broken-coloured cow, with most capacious udder, evidently a deep milker. No. 356, second prize, a rich fawn with fine horn and skin, though built on a smaller scale than the first prize, was a good specimen of a fine bred Jersey cow. No. 358, placed third, with true Jersey head and neck, was a handsome cow of good character, and would evidently stamp her progeny; we subsequently found her to be the dam of the first prize yearling heifer. The Reserve number,

No. 376, was a rich, level cow, with good bag, a trifle heavier in horn and bone than the prize animals. We highly commended eight, and commended four others, all good enough to win in different company.

**CLASS 54—For Heifers calved in 1890**—No. 393, a long, level, rich heifer with good markings was placed first, and a somewhat strong big one, No. 385, but of good wedge shape and dairy properties, came second; No. 387, a silver grey of good quality, constitution and form, was third; and a nice heifer, No. 383, lacking in colour, took Reserve. No. 384, a dark heifer of excellent quality, but with her hocks placed close, was highly commended.

**CLASS 55—For Heifers calved in 1891**—Four heifers easily came to the front; we placed two very good heifers, No. 411, a dark one with a remarkably good fore bag first, and No. 416, a symmetrical animal with deep hind-quarters, fine chine, and remarkably developed milk veins for a young one, second; No. 415, a rich fawn with good skin and well shaped udder, came third, and a dark heifer with teats a little close, took Reserve.

**CLASS 56—For Heifers calved in 1892**—with about thirty animals, out of which there were but five indifferent ones, was as usual the crux for those who had to judge them. The first prize, No. 423, daughter of third prize cow, looks like a heifer that will carry her form beyond to-day and be seen again amongst the prize winners. No. 440, second prize, had very nice shape and character, but did not handle well. A pretty dark heifer came third, and a well shaped little one, wide behind and with promise of a very good bag, took Reserve.

**Guernseys.**—There were 59 entries of Guernseys, being more than double the number shown at Swansea in the previous year. With this exception, however, the display was rather smaller than at any of the recent Shows of the Society. At Bath, for instance, there were 69 entries, and at Exeter there were 68, while at Rochester the number was as high as 82. Possibly this is to be accounted for by the fact that the Guernseys are, generally speaking, a South country breed, and have not yet established themselves very much in the Midlands or West Midlands. It was notable that some half-a-dozen of the entries came from the neighbourhood of the Show. Special prizes were offered by the English Guernsey Cattle Society, as well as by the Gloucester Local Committee, and the quality of the animals in the various classes was considered to be very good.

**Kerries.**—For the first time the Society specially recognised this Irish breed of small cattle, which has quite recently obtained a foothold in this country, and bids fair to very rapidly become popular. Two classes were provided for Kerry cattle and two for Dexter Kerries, and there were altogether 20 entries. The judges, Messrs. G. Titus Barham and Frederick A. Hordern, reported as follows:—

This being the first year at which prizes have been offered for Kerries at this Show, the results cannot be considered otherwise than satisfactory.

In **CLASS 64**, for Kerry bulls, out of four competitors we had no difficulty in selecting No. 511 for the first place, as he was of truer Kerry type than any in the class, being straight, with his tail well set on, of fair depth, not too long in the legs, and with horns of proper form. He was somewhat thick across the withers, and perhaps had rather more throat than is desirable.

No. 503 we put second, a bull of nice quality with very good false teats, nice head and shoulders, though he droops a little at the tail, and his horns might be better. We considered him a trifle too long on the leg for even a Kerry. This remark also applies to the two other bulls in the class.

In Class 65, for Kerry cows or heifers, we awarded first to No. 518, which, when considered on show-points, stood out well ahead of her competitors. She is a cow of nice quality with good head and horns, level on the back, a good handler, tail nicely set on, and possessing a capacious udder of nearly perfect form. No. 519 we placed second, the cow having every appearance of a heavy milker. No. 516, which was placed third, was somewhat thick in the shoulder, and not so perfect in the milk vessel.

There were two young cows in the class which stood no chance against the older and more developed animals.

In the Class for Dexter bulls, unfortunately only one came forward, but we thought him rather a good useful animal, and deserving of the first prize. Every one of the eight entries of Dexter cows put in an appearance, making a very good class, and amongst them were several former winners. Some of these, however, we were obliged to pass over for the reason that they were quite dry, and stood no chance against those which had recently calved. We thought No. 527 a very perfect little cow of good Dexter type, nice head, and a level and square udder. The second cow, like most Kerries, was a trifle high at the tail, but had a milk vessel of fairly good shape, more especially in the hind quarters. No. 526, which we placed third, showed a remarkable development of udder for a heifer with first calf, as we understood was the case. In fact, she promises so well that we think she will develop into a very fine Dexter at some future time.

We would suggest that classes for heifers and young bulls be added to the prize list another year, as it is very difficult to judge them with older cattle so as to give satisfaction to exhibitors. No doubt if this could be arranged the entries would be very much increased.

#### SHEEP.

The show of sheep was distinctly above the average both in numbers and character, and may fairly be considered to be about the best which the Society has ever collected. The total number of entries was 261, as compared with 249 the previous year, and 234 in 1891.

Messrs. Robert Jacobs and W. P. Vosper were responsible for the awards in the Leicester, Cotswold, and Devon Long-wool classes. They observed that the Leicester Shearling Rams comprised some very good specimens of the breed, that there were some Leicester Ram Lambs which looked likely to grow into good sheep, and that the Shearling Ewes of that breed were a commendable class.

The Cotswold Shearling Rams were a very good class, and the First Prize Sheep, sent by Mr. T. R. Hulbert, was made the Champion of the Long-wool classes.

The Cotswold Lambs were only moderate, but there was a splendid class of Shearling Ewes, the First Prize pen of which was also awarded the Champion prize for Long-woolled Ewes. The fact that the Cotswolds carried off both the Championship

awards for Long-wools was highly creditable to the breed. As a matter of fact, however, the breed of the County, though it might, perhaps, have been more numerous represented, has perhaps seldom, if ever, sent better animals into the Show-ring.

The Devon Long-wool Shearling Rams were a strong class of 16 entries, and the judges reported that it gave them some trouble to make the awards. There were many promising Lambs and some pens of good, well-matched Shearling Ewes, the first prize pen running close for the Championship.

Messrs. H. Penfold and J. Flower judged the Southdowns, Hampshire Downs, and other Short-wools. The former, who reported upon the Southdowns, observed that they were not largely represented, and the Shearling Rams, although eighteen in number, were not quite up to the mark. The First Prize Sheep was long, useful, full of quality, and looked like growing into a good two-year-old. He was placed Reserve to the best Short-woolled Ram in the Yard. The Second Prize Ram was much smaller, of good type, but a trifle too short in his hind-quarters, and his wool was rather weak. The Shearling Ewes were a fairly good class, comprising 11 pens. The first prize pen were a very smart, level lot, full of quality and thorough Southdowns, but the faces were a little dark. The second were a very smart pen, one of them, however, being rather weak in the scrag. The third prize pen were even, but not good in the wool. There were 11 pens of Ram Lambs, and the first prize pair won easily, and, in the opinion of the judge, will be heard of again, as they look like growing into shearlings. The second prize lambs were a good pair, very well brought out.

Mr. James Flower reported on the Hampshire Downs, and observed that in the Shearling Ram Class the first prize animal was of capital type and quality; the second being a smart, upstanding sheep, especially good over the back and loins. There was not much difficulty in awarding the first prize in the Lamb Class to a pair of great size with good coats. The second prize pen were much smaller, but well matched, and had the pen which was placed third been more even, they would probably have been higher. As it was, one lamb was much better than the other, but both showed good Hampshire character with colour. The lambs generally showed the effects of the adverse season. In the Shearling Ewe Class, the first prize pen was described as of excellent quality with great size, well grazed and level all over. They also won the Championship for the best pen in the yard of Short-wool Ewes. The second prize went to a level pen of ewes with capital coats, and the third prize pen were very big, smart sheep, with good heads.

Messrs. R. Thomas and J. Treadwell judged the Shropshires and Oxford Downs, and presented the following Report :—

**Shropshire.**—*Shearling Rams.*—This class comprised an entry of 52 animals, which, taken as a whole, were a good show for so early in the season.

We, however, experienced considerable difficulty in selecting the first prize-winner, as no four or five sheep exhibited precisely the same character and type in a sufficiently marked degree to enable us to place them in order according to their respective merit. The first prize we awarded to Mr. Bowen-Jones for a well-developed ram with plenty of good lean flesh. Mr. R. P. Cooper's second prize ram was a typical Shropshire with a good masculine head, but scarcely so good in his skin as we could wish. The late Mr. Graham's third prize ram might have stood higher, but he was somewhat down on his pasterns. Mr. Kirkham was fourth with a useful ram with, however, a somewhat open coat. In addition to the prize winners the class contained several good sheep.

*Ram Lambs.*—20 entries.—This was a strong class, and gave us a good deal of work. We eventually placed a pair of dark-faced stylish lambs first.

*Shearling Ewes.*—This class comprised 20 entries of exceptional merit which did the Shropshire breeders much credit. Mr. Fenn's first prize ewes were well shown, and exhibited great size with nice character and quality.

**Oxford Downs.**—The prize sheep here were easily placed, the first prize sheep, belonging to Mr. Brassey, being an extraordinary good one. It is a great pity that he should leave the country; however, he will well represent the breed at the World's Fair. He afterwards easily won the Champion Prize for the best Short-woolled Ram in the Yard.

The Ram Lambs were a useful lot, as were the Yearling Ewes, particularly the prize winners.

**Dorset Horns.**—A short entry of typical sheep.

**Exmoors.**—A short entry of pretty little sheep.

## PIGS.

There was certainly one of the best displays of pigs that has ever been made in the Society's Showyard. The number of entries was 151, which is considerably larger than on any previous occasion, and comprised a number of good animals, as will be seen from the following report handed in by the judges, Messrs. Heber Humfrey and G. M. Sexton :—

We have to report a very strong show of **Berkshires**. In the Old Boar Class we have seldom seen five male animals together at the age so uniformly good. It was only a question of placing them in proper rotation, for each pig was well worthy of a prize.

In the Yearling Boar Class there were five or six very fine specimens, though not quite so closely matched as the older ones. The first prize pig was well ahead of the rest, and was a nearly perfect model of a Berkshire boar. A brother of this animal was placed second. This pig will probably come to greater size, but he was not so level either on top or underneath as the first prize winner.

CLASS 104 contained four or five useful pairs of little boars, but nothing to call for special remark.

The Old Breeding Sows were very strong in numbers and of the highest merit, and we felt bound to commend the whole class and to ask for an extra

prize. We passed over one capital sow because she had a dark face which, if allowable in any case, deprived her of a chance where the competition was so strong. Two other good sows were a trifle lame. The remaining sixteen were a very even lot and had to be reduced one by one, the shape, condition and markings being so generally good that it was a work of patience to do justice to them.

CLASS 106, for pair of young sows, included fourteen entries; four, however, were absent, and when the prize pens and the Reserve number were selected, the rest formed a group of medium quality. Both in this and in the Class for pair of Boars very few of the pairs were even, and, with only two to select from a litter, they might well be expected to match in every case.

**Large Whites** commenced with Class 107, which were fairly good, No. 858, an easy winner, being a great and good specimen of the breed.

The Yearling Boars were not of a high class, and the young pairs of Boars did not match in type. The winners, No. 866, however, matched fairly well, and are promising.

CLASS 110 was a fairly good Class of Single Sows, although the winner, No. 870, was a long way ahead. She is a grand specimen.

CLASS 111.—The winners, No. 878, were well matched, but the others in the Class were not, nor were they true to type.

In CLASS 112, for **Middle White Boars**, No. 883 won easily, and was a good specimen, as was also No. 889 in Class 113.

There was also a fair competition in Class 114, the winners, No. 895, being true to type and nice pigs.

CLASS 115 was a good Class, and nearly all received a card of merit, the winner being especially good.

There was nothing special to comment on in Class 116, the pairs not being well matched.

The **Small Breeds** were not well represented, and there was no entry of **Blacks**. The strongest competition was in the Single Sow Class, and No. 922 was a fairly good specimen.

In the Classes for **Any Other Breeds** the **Tamworths** came out well, and the competition was good throughout, there being more uniformity of style and character. The Single Sow Class was specially strong and good, whilst the youngsters looked full of promise for the future.

The **CHAMPION PRIZE** was awarded to No. 805, the grand Berkshire Boar already referred to, the Champion Sow being of the Large White Breed, No. 870, a specially good one.

## POULTRY.

The Poultry Show was considerably larger than usual, the total number of entries being 490, as compared with an average entry at the five preceding Shows of 438. Mr. James Dixon, one of the judges, handed in the following Report, which fairly describes the exhibition.

The **Cochin** Classes, although not large in the number of entries, contained some of the most perfect specimens, and in the most beautiful condition. The **Bufs** and **Whites** we never saw better. The **Brahmas**, both lights and darks, were fairly good, and generally in fine condition. The **Spanish** were better than the average, and in nice show form. The first Cock and first Hen were of great merit; indeed, we have not seen better. The **Minorca** Classes were well filled, and the general quality was above the average. **Polish** were of much merit, but the entries were very small. The

**Hamburghs** were really first class, there not being a bad hen amongst them, but again the entries were small. The **Game** Classes were really very fine, the **Blacks**, **Reds**, and **Piles** of unusual merit, and all in fine condition. The **Old English Game** were the largest Classes in the Show, and a really grand lot they were. This is a breed we consider well worthy of encouragement, and they were all in the most perfect show form. **Malays** were fine, the Classes being fairly well filled, and mostly of much merit. The **Indian Game** were not numerous, but the quality was above the average. The **Selling** Classes were well filled with very cheap birds. "**Any Distinct Breed**" comprised a large entry and the quality was very fine generally. **Ducks**, **Geese**, and **Turkeys** were all about an average and the entries very good. The **Bantam** Classes were all fairly well filled, and the quality in all the Classes was of much merit, the **Game** and the **Blacks** and **Whites** being perhaps the best Classes.

### CHEESE AND BUTTER.

The entries of Cheese and Butter at Gloucester were more numerous than on any previous occasion, with the single exception of the remarkable display made at the Bath Show. In a district where dairying is so much practised, it was to be expected that the Swansea record would be beaten, but it was especially satisfactory that the entries, both of cheese and butter, should have so largely exceeded those at Exeter in 1889. The following statement shows the entries of Dairy Produce at Gloucester and at the five preceding exhibitions:—

	Newport, 1888.	Exeter, 1889.	Rochester, 1890.	Bath, 1891.	Swansea, 1892.	Gloucester, 1893.
Cheese .. ..	42	46	25	121	72	95
Butter .. ..	87	81	52	123	82	118
Cream .. ..	8	14	6	13	10	8
Total .. ..	137	141	83	257	164	221

Mr. Jubal Webb, who was one of the judges of Cheese and Butter, presented the following Report:—

The Cheese Show at Gloucester (taken as a whole) was, considering the time of year, very satisfactory. The Show is held between the seasons—whilst it is getting late for some dairies it is, as a rule, too early for the new cheese. There was an absence of ill-flavoured cheese amongst the old, showing that there has been great improvement in the important point of keeping qualities. The old, strong, off-flavoured cheeses we used to find are becoming more rare. As regards the new cheese, they were, as a rule, too young to judge—the flavour in many cases being undeveloped—while some had hardly advanced beyond the stage of pressed curd. Some were more forward, but whether it is well to unduly force cheese is questionable, as doubtless its keeping quality under this condition becomes impaired.



There was a good show of Butter, many of the exhibits being perfect in make, grain, and colour, and the mode of placing them before the public was very tasteful, reflecting great credit on the officials.

The other judge in this section, Mr. James Hudson, sen., reported as follows :—

The month of May I consider an unfortunate time of the year for the show of Cheese, being too late for the Cheese made in the previous year, and too early for those of the present season. Nevertheless, the first Class we judged, No. 127, was fairly good, the first and second prize lots being excellent and considerably in advance of any other.

The next Class, No. 128, consisting of this year's Cheese, contained several exhibits of excellent quality, which possessed all the qualities for turning out good cheese when matured.

There were only three exhibits in the Cream Cheese Class, No. 132, all good, but the second and third prize exhibits had suffered from being packed in unwashed cloth, causing the outside to be musty. I should recommend the packing of all Cream Cheese in parchment (grease proof) paper.

## THE WORKING DAIRY.

The building erected for the purposes of a Working Dairy occupied a position of prominence on the extreme right of the entrance, and, as usual, was the largest and most conspicuous structure in the Showyard. It was practically the same in dimensions and arrangements as its predecessor at Swansea, a few slight modifications only having been made with the view of providing greater accommodation for the staff and competitors. It covered a total area of 130 ft. by 70 ft., the floor space available for the competitions and demonstrations being 90 ft. by 30 ft., and the galleries at the side and end being capable of accommodating 600 spectators. Throughout the week the Dairy was a centre of interest to the visitors to the Show (who found it the coolest place in the Yard), and it was thronged each day during the time of the competitions.

The proceedings at the Dairy combined direct oral instruction and practical demonstration. A lecture was given by Mr. F. J. Lloyd on the second day of the Show, his subject being "How to make the Dairy Industry more profitable." Professor Carroll was principal instructor, and gave each morning a lesson in butter-making, accompanied by practical illustrations of the process by the Society's teachers. There were six teachers, viz., Miss Angus, Miss Barrett, Miss Benjafield, Miss Maggie Benjafield, Miss Smart, and Miss Williams, and the butter-making operations at the Dairy were mainly conducted by them. The general control of the Dairy was in the hands of Mr. G. Gibbons as steward, and Mr. C. R. Knollys as assistant-steward. The

judges of the butter-making competitions were Professor Carroll and Mr. T. Rigby.

The Dairy was completely equipped with a full plant of appliances and utensils for butter-making. Cream separators of four different patterns were shown in operation. The Dairy Supply Company had their Laval machines in four sizes, from the "Small Farmer," which is easily within the power of a dairy-maid, to the "Farmer's Alpha," which separates 60 gallons per hour, and may be worked by a man. Messrs. Freeth & Pocock exhibited one of their "Victoria" separators for hand-power, with a capacity of 20 gallons per hour. Messrs. R. A. Lister & Co. exhibited a large "Alexandra" separator for steam-power, capable of dealing with 200 gallons per hour, and also two separators of a similar pattern for hand-power. A new hand-power separator, invented by Johanson, and manufactured in Sweden, was shown by Messrs. Harrison & Co. Its capacity was 35 gallons per hour. It was arranged for a butter-extracting attachment similar to that introduced to the public a year or two ago, but this was not ready at the time of the Show.

The steam-power used in the Dairy was supplied by one of Mr. E. S. Hindley's well-known vertical engines of 4-horse power. About fifty of Messrs. Bradford & Co.'s "Diaphragm" churns, and a corresponding number of their butter-workers, were used for the butter-making competitions; and Messrs. Llewellyn & Sons and Mr. G. Hathaway also lent a large number of butter-workers and end-over-end churns.

The Society offered a gold medal for the best milking machine, the essential points to be taken into consideration being efficiency, simplicity in working, and economy in cost. Mr. John Gray entered his now well-known machine, but it was not exhibited.

The butter-making competitions excited a great amount of interest, and during their progress were keenly watched each afternoon by the crowd which thronged the building. The number of competitors "broke the record," and largely exceeded, it is believed, that at any similar competition in this country, the entries in the five classes totalling up to 205.

It is noteworthy that in the open competition on the second day of the Show, all four of the prize-winners, and four of those who received high commendation, had each attended a course of instruction at one of the Society's Butter-making Schools. The closeness of the competition was indicated by the fact that only three full points separated the first prize-winner from the highly-commended competitors. In the open competition on the third day of the Show, three of the four prize-winners had also been students at the Society's Schools.

On the last day of the Show the Championship competition took place. This was open only to winners of prizes in the previous competitions. Sixteen of these took part, and the competition was exceedingly keen. The winner of the Gold Medal had been a student at the Society's Schools. We append in this instance the number of points upon which the judges made their awards, as it indicates the excellence of the work done:—

Award.	Competitor.	Points.
Gold Medal.	Mrs. M. Yeates, Flax Bourton .. .. .	58
Silver Medal.	Mrs. M. A. Cambridge, Blymhill, Shifual .. ..	57
Bronze Medal.	Miss E. G. Cook, Surbiton Hill .. .. .	57
R. & V. H. C.	Miss R. Charles, Great Wacton, Bromyard .. ..	56
H. C.	Miss I. Allan, Ripley, Surrey .. .. .	54
H. C.	Miss A. M. Watts, Sarsden, Chipping Norton .. ..	54

Particulars of all the Classes and the judges' awards will be found on pp. xlv.-xlvii. of the Appendix.

### HORSE SHOEING.

For the first time at the Society's Meetings it was arranged to have two competitions, viz., one for the shoeing of Carriage and Nag Horses, and one for that of Cart Horses. The first named competition took place on the third day of the Show, when 51 smiths competed out of 53 who had entered. The judges, Messrs. Aubrey and Barford, reported as follows:—

The selection of the horses had been carefully carried out, as they all had good feet, which was an advantage to the competitors. The work of the latter was, on the whole, a decided improvement upon that done at the previous Show at Swansea, although there was one competitor last year who did his work better than any competitor at Gloucester. The competitors had to take off one fore shoe, prepare the foot, make a fullered shoe, fit it and nail it on, the judges advising them of the principles on which they were to act in the preparing of the foot and the making and fitting of the shoe. The longest time taken by a competitor in shoeing was 1 hour and 31 minutes, and the shortest time 32 minutes. The average of all the competitors was  $47\frac{1}{2}$  minutes.

In the Cart Horse Shoeing competition, which was held on the fourth day of the Show, 36 competitors presented themselves out of 44 entered. The longest time taken by a competitor was 1 hour and 32 minutes, and the shortest  $36\frac{1}{2}$  minutes,

the average time being about 53 minutes. The work was well done, except by about half-a-dozen competitors.

Both competitions excited considerable interest, and drew large numbers of spectators each day.

These competitions, which have been carried on by the Society for many years past, have done much towards bringing about improvements in shoeing. Formerly, shoeing was badly done in many towns and in nearly all country places. The practice, which is gradually extending, of giving prizes for shoeing at Agricultural Meetings greatly tends to spread a correct knowledge of the principles upon which shoeing should be carried out, and to improve the quality of the work throughout the country.

### IMPLEMENTS.

The collection of implements and machinery at Gloucester was one of the largest and best that the Society has ever attracted to its Showyard. It was thoroughly comprehensive, nearly all the most famous makers being represented, while firms of more local reputation endeavoured, with considerable success, to distinguish themselves and mark the occasion. The following figures give some idea of the extent of the display as compared with some of the immediately preceding Shows of the Society:—

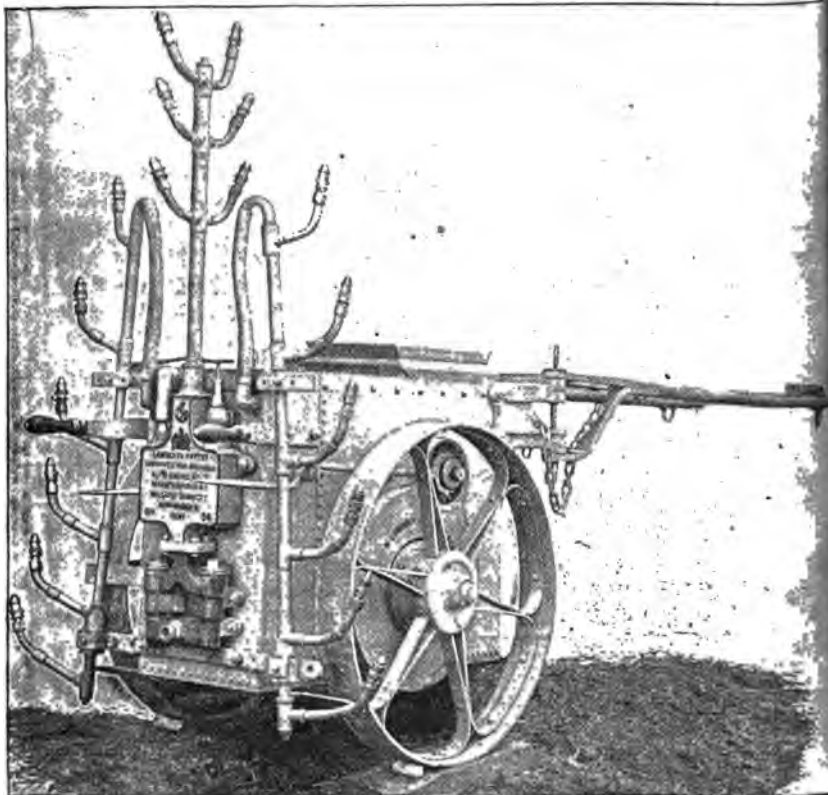
	Newport, 1888.	Exeter, 1889.	Rochester, 1890.	Bath, 1891.	Swansea, 1892.	Gloucester, 1893.
Machinery in Motion, feet run ..	812	616	840	1,106	812	1,204
Agricultural Implements, feet run ..	3,767	3,465	3,510	4,355	3,400	5,195
Stalls, Cattle Foods, Artificial Manures, &c. ... .. feet run	800	550	693	913	736	1,049
Traces and Miscell. Articles, feet run	1,200	735	665	1,207	980	1,225
Space for Greenhouses, &c. } square feet	15,795	11,792	13,775	12,725	10,197	18,518
Total .. ..	22,374	17,158	19,483	20,306	16,125	27,191

The agricultural district in which the Show is held frequently gives a tone, so to speak, to the implement department, its special requirements being reflected in the stands. Gloucestershire is, however, a county of mixed husbandry, and it would have been possible to find examples of almost every description of farming within easy reach of the Showyard.

Although there is only a small breadth of land (33 acres in 1893) under hops in Gloucestershire, the adjoining county of

Hereford runs Sussex a close race for second place in the list of hop-growing counties. Last year (1893) there were over 7079 acres of hop-gardens in Herefordshire, while Worcestershire also contained 3516 acres. The hop-growing industry, if it does not attain quite the supreme importance that it does in the south-eastern counties, is therefore a very important factor

Fig. 1.—“Lambert” Patent Hop-Washer.



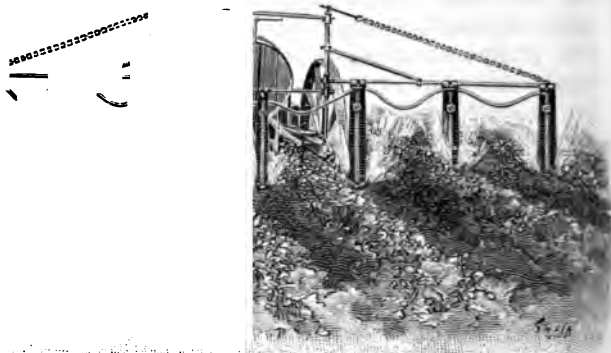
in this neighbourhood, and consequently there was a noticeable prevalence of machines for the cultivation and treatment of hops.

The Tewkesbury Engineering Company exhibited the “Lambert” Patent Hop Washing Machine (fig. 1), which is very simple and effective. One of its advantages is that, by an automatic device, the liquor may be discharged upon the poles and

simultaneously shut off between the hills. In the early stages of growth this considerably economises the liquor, preventing waste between the hills. The upper jets may be set independently to give a continuous spray so as to follow the line of string-work now so commonly adopted; the machine is fitted with improved jets and check valves, and each jet can be turned off by merely turning it round. The entire series of jets can be set to suit the pitch of the poles, which is a considerable advantage on hilly ground; or each jet can be adjusted independently. The jets are arranged on a graduated scale, so that the lower and larger leaves are thoroughly syringed, while the upper and more delicate foliage is subjected to a shower of gentle spray. The construction entirely dispenses with side pipes and reduces the perishable tubing to a minimum, while all risk of choking is prevented. The machine can in a few moments be converted into a fire-engine, to suppress any outbreak of fire, and it can also be advantageously employed for washing fruit trees, filling tanks, sprinkling lawns and cricket grounds, and any purpose for which a powerful force pump is required.

Messrs. W. Weeks & Sons exhibited their improved Simplex Hop-Washing Engines, especially adapted for the Hereford and Worcester districts. These are constructed on what may be termed the "fore and aft" plan, *i.e.* with lines of horizontal jets on each side of the machine. Messrs. Weeks also had specimens of their "Excelsior" Hop-Washers, which deliver the spray through nozzles placed at the rear of the machine. They also exhibited a new back delivery hop sulphurator and lime, soot, and manure distributor.

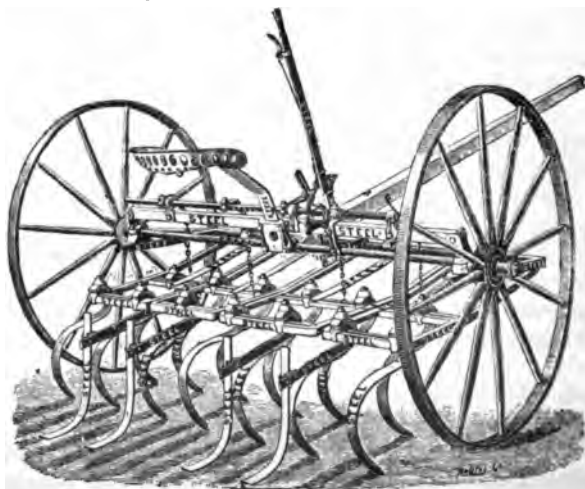
Somewhat allied to the machines just mentioned are the now widely-known appliances constructed by Strawsons, Limited. A new machine, exhibited by this firm at Gloucester, was the Strawson Potato Sprayer (fig. 2). This horse-power sprayer was brought out to meet the demand of large potato-growers for a machine which would distribute the "Bordeaux" mixture effectively and rapidly. It consists of a tank mounted on two  $4\frac{1}{2}$  feet iron travelling wheels, which have a telescopic axle so as to suit any width of rows. At the back is a light framework, which can be spread out so as to extend over seven rows. At intervals along the horizontal feed-pipe depend flexible pipes with nozzles which hang near the ground, and run between the rows and distribute the mixture in a fine spray so as to thoroughly cover the under as well as the upper surfaces of the leaves. The tank holds about 60 gallons of liquid, which is automatically stirred as the machine travels. There is also a reversible pump arrangement, by which the liquid is pumped into the tank, and strained at the same time. The nozzles may

**Fig. 2.—** *Wason Potato Sprayer.*

be elevated, brought close together, or stretched out to 30 inches or more apart as desired. The working parts are adjustable so that the machine may be adapted for all kinds of ground crops, such as vines, indigo, cotton, tobacco, turnips, mustard, &c.

The same firm also showed their improved Knapsack Spraying Machine, for lightly distributing insecticide or fungicide mixtures on growing plants. This is a very convenient appliance for use in the greenhouse, garden, or field, and is similar in principle to one which is very popular on the Continent.

The Massey-Harris Company exhibited a new Spring-Tooth Cultivator (fig. 3), which can be worked also as a grubber,

**Fig. 3.—***Massey-Harris Cultivator.*

scuffler, or harrow. It consists of four solid steel sections, each carrying three steel spring teeth. These teeth are specially well made to resist the greatest strain without breaking or bending, and they are attached to the tooth set by a patented contrivance termed a "helper." This is a short piece of spring steel so adjusted as to give the support, the want of which is so commonly fatal to the tooth after it has been caught in some obstruction. Each of the sections carrying the teeth acts independently, and has a steel pressure spring device which gives great flexibility, and maintains the pressure equally on uneven ground. The cultivator is also sold with a seed box attached. It is undoubtedly a very ingenious and well-made machine. Two or three months after the Gloucester Show the present writer had the advantage of visiting the works of the Massey-Harris Company in Toronto, Canada, and there again saw this cultivator, and learnt that it had become very popular on the other side of the Atlantic, and been well taken up by English farmers. Notwithstanding its light appearance it has proved to be equal to working heavy clay lands. The Massey-Harris Company, who claim in Canada to be the largest makers of agricultural implements "under the British flag," also showed specimens of their sheaf-binders and mowers at Gloucester.

Mr. T. T. Mayos, of Llangunock, Ross, who has on several occasions produced new inventions at the Society's Shows, exhibited a new Combined Plough and Subsoiler (fig. 4),

Fig. 4.—*Mayos' Combined Plough and Subsoiler.*



which consists of a skim and subsoiler. The furrow is carried on a board to rotary beaters which knock all weeds and couch on to the surface. The subsoiler follows, breaking up the soil to any depth required, thus saving, as it is claimed, the expense of scuffling, rolling, and harrowing. The machine is adapted for two or three horses, and will take a furrow of 9 or 11 inches. Mr. Mayos also exhibited his Hay and Straw Press, which was awarded a Silver Medal by the R.A.S.E. in 1887. In these



days no machines seem likely to have a greater future than hay and straw presses, for it is evident that the sale of hay and straw is likely to be one of the mainstays of the arable farmer, while the heavy charges made for the conveyance of such bulky produce by rail necessitates the employment of means to reduce it to portable dimensions.

Messrs. Workman & Sons, of Slimbridge, Gloucestershire, are well known for their cider mills and presses. They exhibited a cider press with quadruple gear arranged to travel on a platform so as to press one grinding while another is being prepared.

*Fig. 5.—Cotton's New Potato Sorter.*



Messrs. George Cotton & Co., of Willaston, Cheshire, exhibited their new Potato Sorter (fig. 5), which was awarded a Silver Medal by the Royal Agricultural Society at Warwick in the previous year. The special feature of these sorters or "riddles" consists in making the wire bottoms separate and detachable from the riddle, so that they are interchangeable. By this arrangement, one wooden rim or frame serves for a number of wire bottoms which can be made of various sized meshes, and changed as required for the particular work in

d. The wire bottoms are woven of various meshes upon a circular rim of wire and fit inside the wooden frame, being held firmly in position by the spring of the wire rim. They rest on four or six wires drawn across the bottom of the riddle at right angles, and thus the wooden frame is not weakened so much as by having holes bored in it for a number of wire bottoms. The riddles are more easily stored, as one rim will serve for a number of wire bottoms, and several can be put away when it is not in use.

The same exhibitors also had a new patent railway milk-churn (fig. 6). Instead of the ordinary tin neck it has a strong malleable iron silver-tinned neck, and the lid is placed below inside the neck to protect it in transit. The lid, which is mounted, is easy to clean, dust-proof and non-splashing, while fastening is self-acting, and secures the lid in the neck at once. Another feature is the all-round handle, which not only

Fig. 6.—*Cotton's Patent Milk Churn.*



facilitates lifting, but also serves as a protection to the churn when travelling.

Messrs. R. A. Lister & Co., of Dursley, exhibited specimens of their "Alexandra" separator in different sizes. Their latest improvement—which was shown in operation at the Working Model Exhibition—is the "Lister-Babcock" Milk Tester (fig. 7). This is an apparatus invented by Professor Babcock of the Wisconsin Agricultural Experiment Station, and has been widely used in the United States. Messrs. Lister have taken it up and made some modifications, which render it more compact and convenient. Mr. G. Embrey, F.C.S., in a paper read before the Society of Public Analysts, observes that "the most serious defect in the original was the oscillation when full speed was attained. It was certainly a clumsy piece of apparatus. Messrs. Lister have, I think, succeeded in producing a much better machine, and this I have pleasure in showing. It will

be seen that it is compact, and entirely overcomes the difficulties of the original form."

Fig. 7.—"Lister-Babcock" Milk Tester.



The apparatus consists of a number of test bottles hung in wire cages from slots on the rim of a horizontal wheel, enclosed in a case or drum. Each of these bottles will contain a sample of milk, accurately measured by means of a pipette, to which is added a defined quantity of sulphuric acid. The wheel on which the bottles are hung is then revolved at a high speed; the cages in which the bottles rest rise to a horizontal position, and the milk is subjected to centrifugal action. After revolving for about five minutes, hot water is added to the contents of the bottles, and they are turned again for two minutes, hot water being also placed in the tank at the bottom of the machine. The test bottles are then taken out, and the percentage of fat in each sample can be accurately read off on the graduated scale marked on the bottle. By the use of a hydrometer and a special set of tables, prepared by Mr. Embrey, the total solids and percentage of solids not fat, can also be ascertained, and thus a complete analysis of each sample obtained. There is no doubt that this appliance provides an

exceedingly ready and quick method of accurately determining the composition of any number of samples of milk, and it cannot fail to be of great service to all engaged in dairy-work, whether as milk producers or distributors.

The Dairy Supply Company of London had as usual a very large and varied collection of machines and appliances for dairying, including the famous "Laval" separators, which were shown not only on their stand, but also in the Working Dairy, where they have for years past occupied a prominent place. It is not easy to say anything new of these well-known and well-tried separators, but it may be of interest to give (fig. 8)

Fig. 8.—*Laval "Baby" Separator.*



an illustration of the smallest, known as the "Baby." This separates 15 gallons of milk per hour, and is easily worked and managed by a dairymaid. To adapt a hackneyed phrase, it is a machine without which no gentleman's dairy is complete. For large dairies a separator of greater capacity is of course required, but for those who wish to make small quantities of butter, a "Baby" is a safe and satisfactory investment.

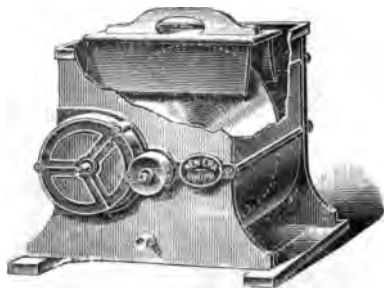
Messrs. Harrison & Co., of London, entered a new butter extractor and separator, called "The Dairyman," which was

tried at the Working Dairy. It was, however, only shown as a separator, the butter-extracting attachment not being ready. The same firm exhibited a number of churns and other dairy utensils.

There was a considerable number of exhibitors of dairy appliances. Cheese-making apparatus was shown by Messrs. Pond & Sons, of Blandford, and Messrs. Wilkins & Son, of Calne, while the exhibitors of other dairying utensils and machines, included such well-known firms as Messrs. Freeth & Pocock, Vipan & Headly, G. Hathaway & Co., Llewellyn & Son, Bradford & Co., Waide & Sons, and R. Williams & Sons.

Owing to a misapprehension on the part of those representing the interests of the "New Era" Disc Churn (fig. 9),

Fig. 9.—The "New Era" Disc Churn.



this new machine was not entered for exhibition, but a place was found for it in an annexe to the Working Dairy, so as to give the public an opportunity of seeing it. There is no doubt that the disc churn embodies a distinctly new idea. Its principle is that of a flat disc revolving vertically at a high speed in the cream. At first sight it appears mysterious that butter should be brought by such an arrangement, and it seems as if some method, other than that of concussion, had been discovered. But it is soon found that concussion, and very violent concussion, is the secret of the disc churn as of all others. The disc, revolving half in and half out of the cream, picks it up on its surface, and it is then thrown off by the centrifugal force against the top of the churn. The cream is sufficiently viscous to be carried up by the disc, but not sufficiently so to resist the natural tendency to fly off again as the disc rapidly revolves. The concussion thus given to the cream is very thorough and violent, and each cream globule, so to speak, is separately dealt with. This is no doubt the explanation of the rapidity with which the butter comes. The

churn is, however, harder to work than one of the ordinary type. It is made and sold by the Disc Churn Company, of Coleman Street, London.

Among the more general implements there was a large number of stands which well deserve notice, did the limits of space permit. Messrs. J. & F. Howard showed an assortment of their world-famed ploughs, which are adapted for every conceivable description of work, as well as their almost equally famous harvesting machinery. Messrs. Harrison, McGregor & Co., had a collection of their celebrated "Albion" mowers and reapers, and Messrs. Hornsby & Co., in addition to the oil engine, described in the last volume of the 'Journal,' had their well-known sheaf-binders, and the new "Hornsby-Hoosier" corn drill. Messrs. Barford & Perkins made a feature of their new hay-tedder, which has won wide repute. Messrs. John Fowler & Co.'s traction engines, Messrs. John Crowley & Co.'s chaff-cutters, Messrs. Samuelson & Co.'s harvesters, Messrs. J. H. McLaren & Co.'s traction engines, the engines and threshing machines of Messrs. Marshall, Sons & Co., and Messrs. E. Humphries, Limited, the gas and oil engines of Messrs. Robey & Co., and the sheaf-binders of Mr. Walter A. Wood, and Messrs. Lankester & Co., were constant centres of attraction to visitors. Messrs. Kell & Co. had one of the largest and most comprehensive stands in the yard, on which were exhibited specimens of nearly every kind of machine used on the farm or homestead. Messrs. W. N. Nicholson & Sons, of Newark, exhibited a "Switchback" grass and clover turner and tedder, of new design, being a new development of the now well-known "Kicker" machine. Messrs. J. Sessions & Sons, of Gloucester, had a very large and attractive collection of stone, slate and marble work, some of their domestic fittings being extremely handsome.

#### SUNDAY SERVICE.

The Working Dairy was, as usual, utilised for the Church service on the Sunday in the Show Week. The service was conducted by the Rev. W. H. S. Davies, Vicar of St. Paul's, Gloucester, and the sermon was preached by the Rev. H. B. Hodgson, Vicar of Thornbury. There was a good attendance of the herdsmen in charge of the stock and others engaged in the Yard.

## Original Articles.

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### III.—*Advantages and Disadvantages of Cross-Breeding.* By GILBERT MURRAY.

#### INTRODUCTORY.

THE subject I have undertaken embraces a wide field, and one which, at the present moment, is of equally grave importance to the owners and occupiers of the soil as to the classes and masses. Now that the British farmer has to compete in the home market with the produce of every land, the only apparent prospect he has of maintaining his position in the matter of meat lies in the production of superior quality; for, whilst the operative classes are fully employed at fair wages, there will be a steady demand for superior descriptions of all kinds of home-grown meats at the top prices of the day.

We cannot attain any degree of success or perfection in cross-breeding except it be by the aid of pure-bred races. I will offer a few brief remarks on pure breeds, without which we could have no crosses. Previous to the last two decades the only two breeds in the kingdom that had a register were the thoroughbred horse of the equine, and the Shorthorn of the bovine, race. Now, every established breed of our domesticated animals has a separate and authentic register of pedigree. This affords a guarantee of purity, and tends to immensely enhance the value of the different breeds, whilst it places in the hands of the intelligent and skilful breeder the means of successfully carrying out the work of improvement by breeding up to and fixing the most desirable characteristics of the breeds. The improvement of our domesticated animals does not date far beyond two hundred years. For many centuries natural selection, or the survival of the fittest, played the most important part. Thus the result of well-known physiological causes has not been so much due to the preponderating influences of extraordinary animal vitality as to wide variations of soil and climate. Close observers may note these changes, sometimes of reversion, sometimes of improvement, due to climatic causes, still going on amongst our domesticated races.

## SCIENCE OF BREEDING.

The skill of the breeder is most clearly seen in the results of his work. In pastoral districts those who have mixed largely among stock breeders know that an experienced breeder will tell at a glance whether an individual male will prove successful as a sire of males or of females. There are few subjects connected with breeding more important than that of the preponderating influence of the male or female parent. The Arabs, who are the most conservative of breeders, attribute the chief virtue to the male, whose descent they can trace through an unbroken line for centuries. Of the sire they are much less careful. In the ordinary everyday experience of the breeder of our domesticated races it is found that the male influences the size, general appearance, external form and muscular development of the offspring, while hereditary diseases and feeble constitutions are generally communicated through the female. At the present time the dairy districts, especially, are suffering from an insidious and dangerous disease known as tuberculosis, which, according to medical testimony, is communicable to man. Though the schoolmaster has relegated to the dark ages the theory of spontaneous generation, there are, nevertheless, contributory causes to disease, such as impure air and water, whilst a scanty supply of unnutritious food induces a weakened and emaciated constitution which affords a ready host for the lodgment of the germs of disease. Now this disease is more generally transmitted through the dam than through the sire; in all probability the germ of the disease is already in the ovum at the time of fertilisation. It is thought that the voluntary and locomotive system are produced by one parent, and the vital and sensitive by the other; the former by the male and the latter by the female. Hence, any attempt to increase the size of a breed by the use of larger sires usually results in the production of a coarse, unevenly balanced animal; but when the female is possessed of more vigour than the sire, circumstances are changed.

An increased demand for animal food and dairy produce, coupled with the low prices of cereals, has favoured breeding and dairying rather than arable culture. Hence the chief object of the breeder is to produce an animal that will give the greatest return in milk or meat within a given time; the present is, therefore, an opportune moment to make an effort to increase the numbers and improve the quality of the domesticated animals of the farm. Great improvements may yet be effected by skilful feeding and management, and by careful selection of breeding animals, but it requires close attention to details and a considerable amount of experience and intelligence.



## THE CULTIVATION AND MAINTENANCE OF PURE BREEDS.

The success of British agriculture depends largely upon the care bestowed in selecting and maintaining the purity of the established breeds of the animals of the farm. The stud, herd, and flock books, by furnishing an authentic record of every breed worth preserving, greatly enhance the value of such stock for breeding purposes. The breeders in distant lands can confidently resort to us either for males or females for the purpose of establishing new flocks or herds, or for renovating and improving native races, and, in the ordinary course of events, it is not too much to suppose that many years must elapse before breeders in other countries can so improve their stock as to be independent of the recuperative advantages of imported animals of pure strains. But, as time wears on, and progress and improvement develop, importers of stock will become more critical in their selections, more particularly in the case of males. It will not be so much a question of price with them as of lineage, symmetry, and character. This should be an inducement to breeders of pure stock to press forward the work of improvement; to exercise a keener discrimination and a more careful and more rigid system of drafting out inferior animals.

## THE IMPROVEMENT AND GRADING OF EXISTING BREEDS.

Throughout the great dairy districts of the midlands, what is known as the Yorkshire or unpedigreed Shorthorn is the chief breed. Throughout the eastern and south-eastern counties, the Red Polled breed preponderates; and though probably it is not quite equal to some other breeds at the pail, it is particularly well adapted to the purpose of the grazier.

Throughout the western dairy counties the cows are mostly of a mixed lineage, consisting of a dash of Devon, Welsh, and Hereford, often on a foundation of the old Gloucestershire, which was at one time a valuable dairy breed. The Welsh breeds yield a moderate quantity of milk of superior quality, and cross well with other improved breeds, but the Yorkshire is *facile princeps* the dairy cow of the day. On farms of medium quality her yearly average of milk is seldom under 600 gallons, whilst on the best farms, where artificial food is largely used, and the cows are milked ten or eleven months between the times of calving, the average is considerably higher. Milk is of more importance to the British farmer now than it has ever been hitherto, and it is likely to continue to be so. Fresh milk is the only produce of the farm practically free from foreign competition; it is true we have milk from other countries, chiefly in a condensed

rm or sterilised, but I do not believe such imports will riously affect our dairy industry.

As a means of increasing the quantity and improving the uality of the products of our dairy farms, I would earnestly rge the improvement of the Yorkshire dairy cow, the materials r which we have at hand. To the young man starting in life, ere is no branch of the farmer's occupation that offers a better urn for an investment of capital, and the exercise of skill and nterprise, than laying the foundation of an improved dairy erd. As a model dairy cow, the Ayrshire of to-day has no qual; the milk-vessel and general conformation are, for dairy urposes, perfect. The young breeder or improver may, there- ore, safely take the bag of the Ayrshire as a type to imitate. he first step in laying the foundation of a dairy herd is to elect a number of young cows carrying their second or third alf, of fair symmetry and quality, with close, well-placed ags, and square-set teats; they should show breeding, though ot necessarily have a recorded pedigree. Weed out inferior nimals by degrees, and replace as opportunity offers. Select a egistered bull from a good milking strain, and, as the cultiva- ion of a female line is the immediate object in view, the bull hosen should not be too masculine in character. Keep a daily egister of the yield of each animal; this is a guide to future perations, and enhances the value of the produce as time wears n. Rear all the cow calves to the age of a year; at this age he most promising should be selected for breeding, and the culls ither sold or fed off at the age of two years. The calves can be well and cheaply reared on sweet separated milk, and the equivalent of the butter fat may be supplied at much less cost. The heifers at the age of fifteen or sixteen months should be put o the bull, and will bring their first calf at about two years old. The inferior milkers of the herd, and those with im- perfectly formed bags, are drafted out yearly, and, being still young, they are passed on—down-calving—to town dairymen, nd, as they are in constant demand by the latter, they will realise good prices. If these suggestions were carefully carried out, a wonderful improvement, not only in an increased yield of milk, but in the enhanced value of the animals, would be effected in the course of a few generations.

#### IN-BREEDING.

The system of in-breeding is generally condemned by superficial observers, who take little trouble to make themselves practically onversant with the subject, and who draw their conclusions rom opinions rather than from facts. Close-breeding is

obviously the means of fixing a type, and, when conducted with skill and judgment, no ill effect is likely to result. But, under a careless system of management, in-breeding predisposes to hereditary disease and bodily defects. Close-breeding may be carried out to a very considerable extent in cases where a full knowledge of the foundation of successive generations is available. To form and perpetuate a character or a breed, we must select animals possessing the characteristics we wish to perpetuate. A few of the leading breeds of the day have been brought to their present state of perfection, not by resorting to out-crosses, but by weeding out, and by a careful selection of the original race. Take the Ayrshire, which, for a specific purpose, is one of the most improved breeds in the kingdom. The origin of the breed is hidden in the mists of antiquity. It is about one hundred and fifty years since the Ayrshires first began to attract attention. They were then described as a small party-coloured race, coarse in the head and thick in the horn. They first became known in the Cunningham, or northern, division of the county from which they derive their name, yet almost within living memory they have overspread to a large extent the south-western counties of Scotland and invaded the northern counties of England. They are used largely for the production of commercial cattle, being crossed with other pure breeds, *e.g.*, the polled Galloway and the Shorthorn, with most satisfactory results. Yet the fundamental strain has been perpetuated and improved entirely through selection. There is no record of any alien blood having been introduced during the whole history of the breed; we can trace the fortunes of the breed and of its improvers far into the last century. The standard of excellence then set up, namely, the production of a perfect type of dairy cow, has been loyally adhered to throughout all the generations which have intervened, with the result that the Ayrshire, taken as a milk producer, is the most perfect specimen of a dairy cow now in existence. I may here be permitted to state my experience of the influence upon her of soil and climate. I have tried the Ayrshire breed on the rich pastures of the Midlands, and found that, with every successive cross, the cows became more disposed to lay on flesh than to maintain the wonted flow of milk.

The Shorthorn is another pure breed which has arrived at a high state of perfection entirely through selection. The only alien blood ever known to have been introduced was through a red Galloway heifer, the descendants of which are still known to Shorthorn men as the Alloy. The thoroughbred horse has also been rigidly guarded against the unfavourable influences of an out-cross, though until a quite recent period, when Stud Books

became general, less attention was devoted to the breeding of draught horses, many of which were undoubtedly of mixed lineage. If we turn to sheep, we are at once confronted with the name of Bakewell and his celebrated Black Ram, the supposed source of all his success. I entertain a lingering suspicion that his success as a breeder was attributable to carefully selecting and close-breeding the ewe flock rather than to the parental influence of the Black Ram. There are plenty of men still living who can recollect the Leicester flock of the late Valentine Barford, of Foxcote, near Towcester in Northamptonshire, who for a period of seventy years and upwards never had a single out-cross. The farm was situated in a high cold district. The sheep ran thickly on the clover leys during the summer, and were wintered on turnips, which they had to cut for themselves, having in addition a small quantity of long hay. Though Mr. Barford was a ram breeder, no artificial food of any kind was used. Farmers complained of the size of these sheep, "in the days when no joint was too large or too fat for a Northampton shoemaker," as compared with the Lincoln, Cotswold and other breeds shown at Northampton Ram Fair in September. Nevertheless, they were of a remarkably uniform type, with fair fleeces of a superior class of lustre wool, and, when used on the nondescript flock of the district, the effects of their prepotency was clearly apparent. Experience and close observation strengthen the opinion that the progress and the improvement of our domesticated animals have been hindered to a far greater extent by the injudicious selection of sires for out-crossing than by close-breeding, where this has been carefully practised.

#### THE VALUE TO THE BREEDER OF REGISTERED PEDIGREE.

To the breeder engaged in the improvement of a registered breed, or whose sole aim is, by crossing pure races, to increase the quantity and quality of meat, or otherwise enhance the commercial value of his stock, authentic pedigree is of inestimable value. Without pure breeds on each side, cross-breeding is a hazardous, if not unsatisfactory, undertaking. This is verified every day in practice. Take the familiar case of the ordinary dairy cows of a district. A good business man will invest 20*l.* or 30*l.* in a yearling Shorthorn bull of good pedigree and descended from a known milking strain. This animal, after having been used for a couple of years on his dairy cows, will, after two or three months rest in the stall, and a moderate allowance of food, be fit for the butcher, and realise fully cost price, while the calves are a great improvement in every respect

on the original herd. But if, instead of purchasing a better animal than the last, he is content to save a bull calf from his best milking cow all the influence of a well-bred sire is lost, and the herd very shortly reverts to its original condition. The chief aim of the owner of any milking breed should be to maintain its purity and improve its most desirable points and properties. It is better to have a few good animals than a large number of inferior ones. A ready market can invariably be found for the former, whilst inferior animals, if drafted out early and crossed with other pure breeds, are invaluable for commercial purposes.

#### EARLY MATURITY.

A predisposition to early maturity can be cultivated. The great fat stock shows of London and Birmingham furnish the thoughtful agriculturist with food for reflection, especially since the age and live weight of the different exhibits have been published. We have the rate of progress, from birth to an advanced age, placed before us. Progress is invariably in inverse ratio to age, which clearly shows that young animals are the most profitable to the feeder; at the same time, the flesh is more nutritive, because more easily digested. A cross between two pure breeds which fully satisfies these conditions, is superior to any other for supplying food for man. The use of young males is most desirable; whilst, in the case of horses and pedigree cattle used chiefly for improving the breed, or for the purpose of raising a superior class of sires, comparatively old males, used on young females, give the best results. There is no class of domesticated animals where the use of young sires shows to better advantage than in the Hampshire Down breed, and, with the exception of mountain breeds, this system might be extended with advantage amongst our improved flocks. I have watched with keen interest the beneficial results of using an old and proved pedigree sire on young Shire mares, and their offspring in their old age have been equal, if not superior, to those which were begotten by them in their prime, excepting perhaps that they were apt to show premature symptoms of old age.

#### CROSS-BREEDING WITH THE OBJECT OF FOUNDING A BREED.

Somewhere about the early fifties, the late John Beasley, Esq., of Chapel Brampton, Northampton—than whom there was no better judge of a Shorthorn—endeavoured to lay the foundation of and build up a new and improved race of cattle of robust constitution, possessing all the leading characteristics of the Shorthorn, including its original disposition to fatten, but com-

ing with it a greater quantity of lean. After mature consideration, and a close study of the chief characteristics of the different breeds, the West Highland breed was selected as possessing in marked degree the desirable and essential characteristics in view; namely, a hardy constitution, superlative hair, a compact well-balanced frame on short legs, and, more important still to the mind of the experienced and practical breeder, a purity of descent unapproached by any other breed in the Kingdom. Twenty cows and heifers, the best which the counties of Shetland, Inverness, and Sutherland could produce, were selected with care and judgment; they were all either dun or red in colour, any animal with a speck of black on the nose being rejected. They were put to a first-class Shorthorn bull, and the female calves were grazed on good pastures, and finished in the pens at the age of about three years; they were kindly feeders, very popular with the butchers, and commanded the best price in the London market. Several of the steers were prize winners, and, in particular, having a second cross of the Shorthorn, was successful not only at many local Shows in open class competition with all breeds, but also won the first prize and breeder's medal in the cross-bred classes both at the Birmingham and London Christmas Shows. Bulls of the Bates and Knightly strains were those chiefly used. All the female calves were mated, and were put to the bull at about eighteen to twenty months old. The first crosses were remarkably uniform in type and character; with every succeeding cross the uniformity of type and symmetrical character became less marked and more uncertain.

#### CROSS-BREEDING FOR COMMERCIAL PURPOSES.

The most profitable breed of cattle for commercial purposes is a cross between two pure breeds; the chief difficulty is in curing females. The owner of a good herd hesitates before he can bring his mind to sacrifice his females. Here, I think, there is room for a new departure. The intelligent breeder who is fully imbued with the spirit of improvement will more readily attain the summit of his ambition by drafting out all inferior animals and crossing them with a well-selected sire. By this means he will effect the two desirable objects of early maturity and superior quality. The time has surely arrived when, in the case of cattle, an ancient practice might with great advantage be revived. Every cross-bred heifer should be altered when a year old. In skilful hands, the operation is attended with little risk, and it would not only do away with the possibility of perpetuating any strain of alien blood, but would obviate the periodic recurrence of retarded development. A

similar policy should be carried out in the ordinary unpedigreed dairy herd, and only the best animals reserved to keep up the herd. The British farmer is now face to face with the whole habitable globe; his only chance is quality. There are no other means known to us so well adapted as this operation to produce quality. The operation does not affect the rapidity of growth, but it visibly affects the quality of the meat. The flesh is more marbled—in other words, the fat is more mixed with the lean—it is more nutritious because more easily digested; there are less offals; and an equal quantity of food produces a greater quantity of prime meat. Crossing has been more or less tried on most pure breeds, the most popular and successful sire being the Shorthorn. The most successful cross is that between the Shorthorn and polled Galloway. The blue greys of the border counties are celebrated throughout the length and breadth of the land; few of these come south. An outsider has little chance of purchasing these at a reasonable price. If every farmer in the kingdom could be induced to make his farm self-supporting in the matter of live stock, then the ups and downs of the market would be less felt by him. We can recommend crossing as a means of increasing the supply of a superior class of food. For dairy purposes, improvement can be successfully carried out by the use of a superior class of sires and by careful selection. The growing importance of the dairy industry calls for a greater degree of skill and attention being devoted to the improvement of dairy herds.

#### VALUE OF CROSS-BREEDING IN THE CASE OF THE HORSE.

The thoroughbred horse is the result of generations of close-breeding. The superior character of the hunting horse is to a great extent due to the influence of his full-blooded sire. The use of cocktail sires has been advocated as a means of improving the modern hunter, but those who reason in this way are apt to forget that size and weight are not conducive to increased speed, nor does increased bone invariably mean greater strength; the conformation of the bone and the shape and power of the muscles are of much greater importance. I have watched with much interest the produce of a typical half-bred mare which for several years bred to a thoroughbred sire. For three successive seasons the produce were prize-winners, and realised high prices; the fourth was by a cocktail, and was a comparatively worthless weed. This is a practical proof of the uncertainty of reverting back to the cross-bred. I could cite numerous cases of a similar character. Within little more than a decade, the Shire horse has been immensely improved for breeding purposes; the

best specimens both of males and females are in demand, and readily realise high prices. But the commercial requirements of our large towns and railways ensure good customers for superior, active, and powerful dray horses. At present the demand is in advance of the supply, though there are plenty of horses of second and third-rate character. Here then is an opportunity for the breeder of Shires. Draft out all inferior mares and put them to a superior pedigree Clydesdale; the influence of the sire would appear in the flat bone, long pasterns, sloping shoulders, and freer action, whilst the Shire would give greater weight. By adopting such a system, the breeder would enhance the value of his produce without trenching on the purity of the original breed; the numbers of pure-bred animals would be reduced, and their quality greatly improved, by a rigorous system of selection; whilst a superior class of commercial horses of great value would be produced. A similar course should be followed with the Clydesdale mare, by drafting out inferior animals, and putting them to a Shire stallion. Commence with two-year-old fillies; these, after having reared two cross-bred foals, would come in for the purposes of the town drayman, the tram companies, or the parcels van. The Clydesdale sire on the Shire dam produces an animal of superior action, the lighter specimens being particularly adapted for vanners, where a certain amount of power combined with speed is a valuable essential.

#### VALUE OF CROSS-BREEDING IN THE CASE OF THE SHEEP.

The value of pedigree has long been fully recognised amongst sheep breeders, and most pure breeds have their Association for the registration of the pedigree of both sire and dam. Yet within living memory several of our leading breeds of sheep have been originated and perfected by skilful crossing and careful selection, whilst the old-established races have been much improved. Owing to its rapid development and early maturity, the sheep is susceptible to a speedy change in character. Some of the older breeds have dwindled down to a small flock in a few hands. This is much to be regretted. Take, for example, the blue-faced Leicesters of the Midland Counties. Their careful breeding from the days of Bakewell induced a prepotency not surpassed by any other breed, and the breed has contributed more or less to the formation of several of what are now considered pure breeds. The most perfectly formed and most symmetrical sheep I have ever seen was a cross between a Leicester ewe directly descended from Bakewell stock and a Southdown ram bred by the late Jonas Webb.



For the production of fat lamb under ordinary conditions, there is no sire equal to a pure-bred Leicester. Crossing is rapidly increasing, and there seems a danger of losing, at no very remote date, some of the old and most valuable breeds. It is obvious that the production of a superior class of mutton is greatly increased by a judicious system of crossing, but without pure breeds there can be no successful crosses. The owners of pure-bred flocks should use every effort to improve them rather than sink their identity in a cross. The Lincoln, an old-established sheep, is now being largely crossed by the Hampshire Down, the produce of which is popular with consumers, and, when not too large, commands the best prices of the day. The Hampshire ewe and the Cotswold ram form a cross producing a maximum weight of meat at an early age. The farmers in the dairy counties sometimes cross the Shropshire ewe with the Hampshire ram in order to produce fat lamb, but for this purpose a Border Leicester would be much better. The finest mutton we have is the result of the cross between the Scotch Mountain ewe and the Border Leicester ram. What is known as the Limestone Leicester, a breed indigenous to the peak country of Derby and Stafford, crosses well with the Shropshires, though it is inferior in quality to the latter.

#### SUMMARISED CONCLUSIONS.

The first and most important consideration among breeders should be the improvement and maintenance of the established pure breeds of the domesticated animals of Great Britain. From my point of view, this can best be effected by a carefully-conducted system of close-breeding. Whatever may be the breed, there is a growing demand for the best specimens, both male and female, not only for exportation, but for home use. I confidently urge the owners of pure-bred herds and flocks to closely draft out all inferior animals; by this means the improvement of the foundation stock is accelerated and its value increased year by year. The pure-bred females when drafted out should be crossed at an early age with a pure-bred bull of a different breed. In this way a class of commercial cattle can be produced in which that most desirable characteristic of early maturity, namely, a maximum quantity of meat of a quality that cannot be surpassed, on a minimum quantity of food, is fully developed. All the crossbred females should, for various reasons, be spayed. The British farmer is suffering far more from a cycle of low prices all round than he is from a shrinkage in the volume of his produce. Changes appear to set in the direction of an increasing demand for meat and milk for the

tenance of the great army of industrial toilers. Hence, the  
 ing farmer should direct his best energies to the improvement  
 the ordinary cow, so as to insure increased produce, and  
 breeding of a class of animals which, when no longer  
 useful in the dairy, will, by means of a judicious cross,  
 produce animals of commercial value. As regards the flock,  
 the principles laid down regarding cattle apply with even  
 greater force to sheep. Improve the pure breeds by the  
 use of a superior class of males, and, as far as practicable,  
 range that only the culls shall be crossed with a distinct  
 one. For this purpose, I prefer the use of a lamb as the  
 sire; this tends to strengthen the inherent properties of early  
 maturity, which is one of the chief objects of the cross.

The onus of supplying the commissariat of a large and  
 increasing population is a national rather than an individual  
 burden, and my subject, fascinating and interesting as it is,  
 touches only the fringe of one of the most important questions  
 relating thereto, but one which deserves to be more closely  
 investigated.

IV.—*The Breeding of Light Horses.* By JOHN HILL,  
 Felhampton Court, Church Stretton.

INTRODUCTORY.

I was in a rather unguarded moment that I accepted the  
 invitation of the Bath and West and Southern Counties' Society  
 to write a paper on the above-named subject for their Journal.  
 More mature reflection convinces me that I have under-  
 taken a subject which, besides being beyond my powers to  
 do justice to, has been so thoroughly treated over and over  
 again by the best known authorities that, whatever I write,  
 ill, I fear, be a repetition of a well-worn theme, and appear  
 stale and uninteresting to my readers. Under these circum-  
 stances, I have decided that it will be best, as far as possible, to  
 confine myself to the narration of my own experience and  
 views, supplemented by such facts as have either come under my  
 own notice, or have been collected from those with whom my  
 somewhat varied business relations have brought me in contact.  
 I propose to treat the subject briefly from a national point of  
 view, keeping more especially in mind the value of horse  
 breeding as a part of the agricultural industry and as a means  
 by which the ordinary tenant farmer can supplement the rent-  
 paying stock on his farm. As the various breeds of horses and

ponies are each adapted to different districts, and one and all are, if judiciously handled, most important items of the farmer's stock-in-trade, I shall say something of each breed, and of the practical way of treating the brood mares and stallions, and the foal from its birth to the time it becomes fit for the market.

#### THE DEMAND FOR LIGHT HORSES.

Great Britain and Ireland have for centuries been famed for the live stock produced; all nations acknowledging this and from time to time exporting from our shores the best that money can purchase. We have stood this constant drain for years, but still the foreigner comes, and still finds what he wants. The strain has indeed been severe; and, some twenty years ago, it almost looked as if horse-breeding in this country was to be a thing of the past. Since that time what a change has come over the scene! Stud books and societies have been formed on all sides. The Hunters' Improvement Society, the Hackney Society, the Cleveland Bay and Yorkshire Coach Horse Societies, the Shetland Pony Society, and now the recently formed Polo Pony Stud-Book Society, are evidence of the wonderful revival of the light horse breeding industry. The Royal Commission on horse breeding and the instituting of the Queen's Premium for hunter stallions have given an enormous impetus to the business. The establishment, too, of a stud farm in Ireland, supported by a Government grant, for the benefit of the congested districts, is a proof that this country is fully alive to the importance of the national industry. The large number of horses required for military and commercial use, however, conclusively shows that still there is room for a further development of our resources; and, whether we look at it from the side of peace or war, the tremendous importance to this empire of encouraging the breeding of the best light horses, and in increasing numbers, must be evident to everyone. The climate of the United Kingdom is specially adapted to the breeding of horses with good constitutions. The latter is almost a necessity for horses used for all ordinary purposes, whilst in the case of army horses, especially those required in artillery corps and for the use of the commissariat, the difference between a hardy, stout, wear and tear English or Irish horse and a soft flabby foreigner may mean the difference between victory and defeat.

#### CONDITIONS TO BE TAKEN INTO CONSIDERATION.

In these days of agricultural depression it has been the fashion, among a certain class of the so-called farmers' friends

and advisers, to hold out the breeding of light horses as a specific for all the farmers' woes. These well-meaning persons for the most part write in total ignorance of the subject either from one point of view or the other. They may know something of the breeding of horses themselves, or have heard of the success attending the practice of some of their friends, but it is certain that they know nothing of the business and needs of agriculture. In the first place, the breeding of every class of horse is attended with a considerable amount of risk, and is, at the best, a speculative undertaking, which few men are really adapted to carry on to successful issue. Again, some districts are altogether unfit for growing or pasturing horses; and it is only by the most judicious selection, both of the land, and the breed of horse or pony suitable for it, that any probability of success can be looked forward to. Horse-breeding, carried on as a rich man's hobby for amusement and for the assistance of the neighbourhood, cannot for a moment be regarded as practical agricultural stock-farming. At the same time, under favourable conditions and good management, a few good brood mares are a valuable addition to the general live stock of a farm, even if their produce are disposed of as foals, so as to avoid the risk and expense of waiting till they are ready for work before putting them upon the market. To attempt anything more than this, in the large majority of cases, means disappointment and loss, as very few men are really able to handle and train a horse so as to make the best of him. It is usually the dealer, or dealing farmer, able to drive and ride as a finished horseman, who makes the profit, and the sooner the average run of horse-breeders sell their young stock the better it is for them.

#### GENERAL MANAGEMENT.

The general management of all breeding stock should follow out, as far as possible, the laws of nature and the conditions which would tend to develop and mature the young animals in a natural state. In Great Britain, of course, this cannot be done, owing to climatic and other influences, together with the high rent of the land on which our best stock is kept. This necessitates the use of artificial means of housing and feeding, to make the most of the land by keeping a large number per acre; and by supplementing with invigorating nourishment the moderate quality of many of the pastures. In many parts of Ireland the pasturage and climate are such that young horses will grow and thrive, better by far, without assistance than those of exactly similar breeding will do in England, with the help of artificial food. This is the real reason of the superior

quality of the Irish hunter, and so much is this acknowledged that many breeders in England have land in Ireland upon which to rear their young stock until three or four years old. This plan is following nature as far as practicable, and, wherever the land is suitable, the less artificial feeding and pampering the better. There can be no hard and fast rule laid down as to feeding, so much depends upon the surroundings and upon the individual constitutions of the young animals themselves. Ponies of course do not require the same feeding or as much care and shelter as other light horses. But there are two fundamental rules to be observed in all breeding establishments, viz., never to let a foal be checked in its growth for want of food, or during the first winter after it is reared, and to always allow it plenty of air and exercise. Hot boxes, high feeding, and no exercise are the cause of as many disappointments as want of care and insufficient food. The same rule applies to stallions, brood mares, and young stock of all ages. Judicious feeding, abundance of fresh air and exercise, and, when circumstances permit, liberty in pasture or paddock, with a shed to protect them from flies in summer and rough storms in winter, together with practical common sense in dealing with each individual animal, will go far to save a large veterinary bill for diseases contracted by bad ventilation, defective drainage, high feeding, and confinement.

#### STALLIONS.

One of the most important parts of breeding is the treatment of stallions. High feeding and want of exercise are two fatal errors during the season, and even during the remaining portion of the year stallions are too often neglected and left to stand day after day in hot, small boxes, without the manure even being removed. I am, of course, only speaking of the treatment so often found on farms where no regular attendant or staff of stable servants is kept. A stallion when off duty should if possible be turned out in a well-fenced small paddock, with a shed attached, and have access to plenty of water; during the summer months, if the grass is not sufficient, he should be fed with vetches or clover cut green, and, as this food fails, hay with bran and crushed oats should take its place. The bran is a most important part of the diet, and it should be of the best English quality. Foreign bran, and that which is made by roller machinery, is usually very inferior stuff, and has little nutriment left in it. The best that can be obtained is the cheapest. Twice a day, morning and evening, is often enough to feed when a horse is not in work. I like the crushed oats and bran to be well mixed with chopped hay and wheat straw.

the whole mixture well damped in the manger, so that the seeds cannot separate or blow the bran from the rest of the ingredients. I consider a bushel of oats and a bushel of bran fair weekly allowance. This should be gradually increased as the season approaches, and a quartern of cracked peas added three times a week. A bran mash with linseed every Saturday night during the season, while the horse is resting on Sunday, is very beneficial. If it is not convenient for the horse to have a run of a paddock, it is absolutely necessary for his health that he should be either turned into a yard to stretch his legs, or led out every other day for exercise. All physic and purgative drugs, which are generally resorted to by ignorant owners to improve the look of the animals' coats and keep up unnatural excitement, should be avoided as much as possible. Before leaving the subject of the treatment of stallions, which in this paper be only briefly touched upon, I am anxious to draw attention to the most important question of the great difficulty experienced in obtaining the services of suitable and reliable grooms.

#### GROOMS IN CHARGE.

The men in charge of stallions travelling a district incur temptations which are occasionally more than they can withstand. At nearly every house where they call, offers of drink are made; and, not unfrequently, cases come to light of unscrupulous persons endeavouring to tamper with their honesty, by persuading them to take less, or no fees, for the service of the horse under their charge, upon receiving a small gratuity themselves. I believe the class has of late years very greatly improved, and numbers of thoroughly honest, sober, and respectable men are employed; but I cannot help thinking that there were a society formed to which these men could belong—where a register might be kept of men seeking such employment, and holding testimonials from late employers as to their character—it would be a great benefit to owners of horses, to grooms, and also to the public at large. I would suggest that the various Stud Book Societies and the Hunters' Improvement Society should take the matter up.

#### BROOD MARES.

As in the case of stallions, so with brood mares, the nearer they are kept in a natural state the better. If they can have a run at grass all the winter, so much the better; they require little or no shelter if they have plenty of grass to pull at, supplemented with such diet as recommended in the case of

stallions. In any case they should, if possible, be able to pick a little grass before foaling; and, if not, the supply of bran and linseed should be increased, so as to keep them cool and their bodies healthy and open. When the time of foaling draws near, the greatest care and watchfulness are required. Some people lay down rules by which they profess to be able to tell, by the appearance of wax on the teats and other signs, even to a few hours when the foal may be expected. Sometimes, of course, they are right, but my experience is that mares are never to be depended upon after their time is up, and milk has filled the udder. A well-known man, who had perhaps had more experience than almost any one with foaling mares, upon my once asking his opinion on this subject, exclaimed: "Why, sir, the longer I live the less I know about them!" And I think this was about as true a sentence as ever was uttered! The best thing to do is to carefully note the recognised signs as they show themselves, and never relax attention or watching; at the same time make no undue fuss or disturbing visits, and if possible, weather permitting, allow the foal to be born in the field or paddock. In watching foaling mares in loose boxes, an excellent plan is to have a small window in the wall or door through which the attendant can look from time to time without disturbing his charge by constantly opening the door. Leave all to nature as far as possible, but, if assistance is found to be necessary, let it be at the same time prompt and effective. Always remember that mares are particularly sensitive and shy, and all noise and fuss should be avoided. These remarks may perhaps seem very common-place and unworthy of the notice of those who have studied the subject scientifically; but I think those who have been practically engaged in horse-breeding will bear me out in saying that the carrying out or neglecting of these simple rules of management represents the difference between success and failure.

#### FOALS.

When foals are born, in the case of well-bred ones especially, very often they attempt to struggle to their feet before their strength will allow them to stand. I have found it an excellent safeguard against their being seriously hurt, and even killed, by falling against the sides of the loose box or shed, to place a cord round the neck, which just steadies them as they attempt to feel their feet. If healthy and all right, they are soon able to stand alone.

Great care should be taken to ensure their sucking as soon as possible. Some foals take to it at once, but sometimes

There is a difficulty both on account of the weakness or awkwardness of the foal, or restlessness and temper of the mare. In such cases great patience and good temper must be exercised by the attendant, for by carelessness in this matter have known valuable foals lost through starvation, which, in spite of the attendant's assurance to the contrary, has been amply proved by post-mortem examination.

All foals should be taught to eat crushed oats and bran before they are weaned in the autumn, and in every case they should be handled and led.

#### DOCKING.

Some people dock their foals when a few weeks old, and I agree with this practice, if they are to be docked at all. It is said that it is cruel because the flies plague them during the summer, but I do not believe that, owing to the thick mossy coat of the foal, flies make very much impression, and the little hair they lose in the operation does not materially help them in their first summer to drive them off. With some horses, docking is almost a necessity to enable them to be used with safety and comfort. And without doubt it is a less painful operation to a foal than to an older animal.

The management of all sorts of young horses is practically the same; at two years old it has always been my practice to have them broken to ride and made quite handy and tractable. They are ridden again at three years old. Then, after a liberal keep, they are fit for work the following winter, and for sale when four years old. These remarks refer more especially to hunters, and high class hacks and harness horses. Ponies being hardier, and coming earlier to maturity, need less liberal treatment, particularly those of mountain type. The pony mares are left out winter and summer, the foals being usually born in the fields, and little or no assistance is required at the time of foaling. Any one wishing to make breeding a success must be bound down by no hard and fast rules of proceeding, but must exercise observation and sound common sense.

#### HUNTER BREEDING.

It is very satisfactory to see a growing opinion, on the part of those best able to give it, that the breeding of hunters should be really systematically encouraged and become more a national industry, instead of being left, as at present, mainly to spasmodic efforts of individuals. The breeding of hunters, to be successful, must be conducted with as much care and judgment as are brought to bear upon other established varieties of live stock.



To mate at random a mare of unknown breeding, however good-looking she may be, with an apparently suitable blood stallion, very generally tends to disappointment, unless by chance the cross happens to "nick." Much more certainly will failure follow the union of mares so often used to breed from because they are good for nothing else, and with the first and cheapest stallion that their owner happens to be near to. To obtain anything like certainty in breeding, it is absolutely necessary to know the pedigree of both parents, and, if possible, also their size, form, stoutness, and soundness—with as many particulars of their ancestors as can be obtained.

Before and during the year 1880, I, among others, wrote many letters on this subject to the 'Agricultural Gazette' and other papers, strongly advocating the breeding of hunters from hunting sires and dams—and the formation of a hunter's stud-book. The outcome of the "agitation" was the formation, not of a hunter stud-book, but of the "Hunters' Improvement Society," followed by the record for mares taking premiums, at the annual show, and the establishment of medals for brood mares, at many of the local agricultural shows. The wonderful results achieved by the movement are becoming more apparent year by year, and, as the produce of these recorded mares arrive at maturity, if only some inducement could be held out to breeders and farmers to retain the best fillies until at least they had produced one foal,—which they might do at three or four years old without injury—the quality of our hunters would rapidly improve.

#### HUNTER STUD-BOOKS.

Whether it will ever be possible to establish a stud-book for hunters seems rather uncertain, but, if it were properly started, and the foundation stock strictly inspected, or if prize winners were admitted without inspection, I cannot help thinking that we could improve our hunters as much as the hackneys have been improved. I have long held an opinion, and I hold it now more strongly than ever, that weight-carrying hunters can be bred without relying exclusively upon the thoroughbred sire for their production. Opinions, as to what sire and dam should be used to produce hunters, are so various, and the whole subject has been so often discussed, that it is difficult, especially in a country where every man considers he knows more about a horse than his neighbour, to convince any one or to say anything new. I believe, and few will deny, that if you can get a horse up to your weight, the more thoroughbred he is the better. But weight-carrying thoroughbred horses are the exception, and

only in the hands of those who can afford to give long prices ; we have to look about for a substitute. Many, and perhaps the most competent, authorities assert that no horse should be used as a sire of hunters unless clean thoroughbred. No doubt this is for the most part, the correct view, and on no account should a half-bred sire be used, unless his exact pedigree is known. The best fencer and most brilliant hunter I ever rode was a half-bred horse by a half-bred sire from a light-legged cart mare. He was the most perfect gate jumper and the boldest at water is possible to imagine. Bought, as a four-year-old, for 40*l.* from the farmer who bred him, at six his owner refused 300*l.* but from fifteen to twenty minutes, when the hounds ran fast, was enough for him : and this is the case with nearly all so bred, unless the dam happens to possess extraordinary powers sufficient to counteract the want of stamina in the sire. On the other hand, I have found by experience that the stoutest of hunters can be bred from a half-bred sire, when he comes of *strains of known good hunting blood*. I owned two strains of hunting mares for about twenty years, and by mating those together I bred a stallion which perhaps got some of the stoutest and best hunters which Shropshire had seen for many years—and one great advantage of using such a sire was, that his stock invariably were up to weight. I have seen the same dam throw 12-stone and a 15-stone horse ; the former by a thoroughbred, and all appearance suitable for a hunter sire, and the latter by my half-bred—or rather, “*hunter-bred*”—stallion.

The question of a Stud-book for Irish Hunters is now being discussed, and it will probably be shortly laid before the Royal Dublin Society. If such a Stud-book be established, it will increase the value of the Irish hunting stock more than anything that can be done. And although we think that no one knows anything about a horse who is not a native of Great Britain or Ireland, still we should take a lesson from the “foreigners” who refuse to breed from a mare, however good-looking she may be, unless they are certain of her pedigree. The formation of such a Stud-book will of course admit the entry of all those so-called half-bred stallions for which Ireland is famed—and it will prove to Englishmen that sires of hunting blood should be recognised and permitted to compete for prizes awarded to “The best thoroughbred Stallion for getting weight-carrying Hunters.” I had once to reject “New Oswestry” in a show ring, because he could not fulfil the requirements laid down, as being a *thoroughbred* stallion—and taking him as an example, the absurdity of the restriction will be seen at once. “*New Oswestry*” ran *Stella*” to a head in the Grand Stand Steeplechase at Cork in 1871, when there were eighteen runners—and he broke down

a quarter of a mile from home. He beat Massinissa on the flat by a head, and Massinissa beat "Bluegown," who won the Derby; and yet this horse was not allowed to compete as a sire of hunters! Again, "*Ellesmere*"—a first-class hunter and stock-getter—by New Oswestry, dam by Glenalvon, g.d. by the Steamer, g.g.d. by the Emperor, is considered not eligible. Yet every sire in his pedigree was noted for getting the best hunters in Shropshire and the district.

#### HALF-BRED HUNTER STALLIONS.

This subject has again been under discussion at the Council of the Hunters Improvement Society, and, in my opinion, a most regrettable decision has been arrived at. The New Rule lays it down that only such half-bred stallions shall be allowed to compete for premiums as can show that either sire or dam have won races, or that they themselves have won races under Jockey Club or Grand National Hunt rules. No distance is specified nor weight that must be carried, and it appears that a light weedy animal, whether it be a stallion or mare, is considered to be suitable for producing hunters, provided it has only won something between the flags.

Now what possible qualification for a hunter sire can this be, especially as the quality of the race is not defined? Many of the thoroughbred premium stallions and other good sires of hunters have never won a race, and many have never even run one at all—so why make it a *sine quâ non* for half-bred ones? Three generations of good hunting record should be sufficient, provided the horse himself is all that could be wished. Grumbling is very unpleasant work at any time, and specially when people are doing their best in a good cause, but surely, when a horse like *Ellesmere* is barred from competing for a premium which is supposed to stamp a horse as one of the best of his class for producing hunters, it is full time that some steps should be taken to alter the rule so as to admit such horses without a racing qualification.

#### SELECTION OF BROOD MARES AND STALLIONS.

When selecting mares and stallions for Premiums, I think too much is very often made of blood and quality without regard to bone and substance. It is said that "Peter the Great," in order to obtain a fine race of men for his army, made his soldiers marry large women, on the principle that the same thing held good in the human race as with horses! so that it is no new idea that to produce full-sized powerful horses small sires

should be mated with large mares. I have always found that little mares throw small stock, unless they are descended from pony blood, and the evidence I shall give goes to confirm my opinion.

I was talking the other day to a shrewd Welsh farmer, and he gave it as his opinion that the reason the Welsh cobs are not so good as formerly, and often lose the fire and dash for which the breed is so celebrated, is owing to larger sires of the hackney type being used, instead of their being bred, as formerly, from the smaller Welsh pony sires. It seems pretty clear, therefore, that it is for every reason right to encourage the breeding from full-sized dams. I would never give a hunting premium to a light racing mare, if it were possible to find another. Quality and blood of course are essential for a high class hunter, but most men who hunt ride over twelve stone, and heavier weights must be content to sacrifice something for power and substance. A hunting brood mare should have plenty of length and depth of body, with well sprung ribs standing on short legs. Her shoulders should be well laid back and not heavy at the points. A strong shoulder need not be objected to, if only it is well placed. Well-formed strongly-made hocks, a clean-cut head and bright eye are specially to be looked for, and she should always be a good walker, moving with an easy springing stride and stepping out straight from the shoulder.

With regard to stallions, size is not so much a consideration, if they have plenty of bone and muscle, and good hunting action; and the same thing is necessary in their formation as in the case of the mare.

#### THE UNCERTAINTY OF BREEDING.

It may be of interest to here reproduce with several additions some particulars (which I contributed to the 'Agricultural Gazette' in 1880), of the produce of hunting brood mares at that time in my possession. They will show very clearly the great uncertainty of breeding from thoroughbred sires—even when the utmost care is taken to select those which are suitable. The stallion of my own breeding was called "Beggarman." He was by Outfit; dam, Fanny, by Jordan; g.d., Reta. He stood 16·2 hands, and was well up to 15 stone; his dam was up to the same weight and a brilliant huntress. I rode her seven seasons—his grand-dam was ridden by the huntsman of the Hurworth and won several races over a country. I mated this horse with "Gluepot," a very high-class mare which carried me ten seasons, and took seven first prizes in the show ring. The result was most satisfactory—the produce being valuable weight-carriers,

Particulars of dam, pedigree, height, age; when first foal dropped; weight she could carry hunting.	Year of foaling.	Produce colt, or filly.	Height at 4 years old.	Qualified to c hunting.
DAIRYMAID, by Young Touchstone, dam by Mr. Vever's Little Tommy. Dairy- maid was 16 hands high, she was 3 years old in 1860, and was fit to carry 13 stone .. .. .	1860	colt	16 hands .. .. .	14 stone .. ..
	1869	filly	16 .. .. .	15 .. .. .
	1870	filly	15·3 .. .. .	12 .. .. .
	1873	colt	16·1 .. .. .	14 .. .. .
	1874	colt	16 .. .. .	..
	1875	filly	14·3 .. .. .	..
	1877	colt	Likely to be 15·3 hands	Likely to carry 1

FANNY, by Jordan, dam Reta. Reta's pedigree is unknown, but she was believed to be thoroughbred. Fanny was 16 hands high, she was 11 years old in 1873, and was fit to carry 15 stone.. .. .	1873	colt	15·3 hands .. .. .	13 stone .. ..
	1875	colt	16·1 .. .. .	15 .. .. .
	1876	filly	15·2½ .. .. .	13 .. .. .
	1877	filly	Likely to be 15·3 hands	Likely to carry 1
	1878	colt	.. .. 16 ..	.. .. 1
	1879	colt	.. .. 16 ..	.. .. 1

MEDORA, by The General. She was 16 hands high, she was aged in 1867, and was fit to carry 14 stone .. .. .	1867	colt	Died as a yearling ..	Full of promise
	1868	colt	15·2½ hands .. .. .	12 stone .. ..
	1869	colt	16·1 .. .. .	14 .. .. .
	1870	colt	15·2½ .. .. .	13 .. .. .
BROOMER, pedigree unknown. She was 15·1½ hands high, she was aged when her first colt was born, and was fit to carry 13 stone .. .. .	1864	colt	15·3 .. .. .	14 .. .. .
	1866	colt	15·2 .. .. .	.. .. .
	1869	filly	15·3 .. .. .	12 .. .. .
	1869	colt	16 .. .. .	13 .. .. .
	1870	filly	15 .. .. .	.. .. .

N.B.—Gluepot was ridden ten seasons as a huntress, winning five First Prizes, she then acci-  
knocked a hip down, by being cast in her box, and was put to the stud, and won two First Prizes as  
ma.c. She bred Persistency and Tramp, both by the half-bred hunter sire Beggarman (see Note above  
were both fit to carry 15 stone, and were high-class hunters. After winning Second Prize at R. A

## HILL on the Breeding of Light Horses.

Age of sire.	Height of sire.	Sire's qualifications.	Remarks.
Clark .. ..	About 15·3 hands	Noted hunter's sire .. .. .	See <i>Produce Note</i> .
John o' Newbury	16·1 hands .. ..	Great power and substance ..	See <i>Produce Note</i> .
Richard .. ..	About 16·2 hands	Powerful .. .. .	This filly was sold for ..
John o' Newbury	16·1 hands .. ..	Great power and substance.	
William .. ..	About 15·3 hands	Sire of many noted hunters ..	{ This colt was only fit for harness work.
Thomas .. ..	" 16·1 "	{ Up to great weight; bred by late Lord Glasgow .. .. .	{ This filly was only fit for harness work.
Williamington ..	" 16 "	{ Sire of good hunters and steeplechase horses.	

### *Produce Note.*

This colt developed into a grand 14-stone hunter, and won several Hunt Steeplechases. Gluepot, a valuable hunter and brood mare, winner of seven First Prizes: she was the dam of 1 by Beggarman, and grand-dam of "Real Glue," by Ellesmere, recently purchased as a hunter by Sir Walter Gilbey, Bart. Also dam of Treasure, the property of Mr. C. Newson, of Oakhampton, winner of Lady's Plate at Leicester, and other races.

John o' Newbury	16·1 hands .. ..	Great power and substance.	
William .. ..	About 16·1 hands	{ Up to great weight; bred by late Lord Glasgow .. .. .	See <i>Produce Note</i> .
Richard .. ..	16 hands .. ..	{ Grand sire; bred by late Lord Glasgow.	
William .. ..	About 16·1 hands	Sire of steeplechase winners.	
Richard .. ..	16 hands .. ..	{ Grand sire; bred by late Lord Glasgow.	
William .. ..	About 16 hands.		

### *Produce Note.*

1875. Colt named Beggarman, kept to breed from. Sire of many good hunters, including Persals. See Note on Gluepot.

William .. ..	About 16·1 hands	Sire of steeplechase winners.	
" .. ..	" " " "	" " "	
William .. ..	" 15·3 " "	Sire of many noted hunters.	
William .. ..	" " " "	Great power.	
William .. ..	" " " "	Small wiry horse.. .. .	This colt was only fit for harness work.
William .. ..	" 16·1 " "	Sire of steeplechase winners ..	{ This filly was only fit for harness work.
" .. ..	" " " "	" " "	
Principal .. ..	" 15·2 " "	Small neat horse.. .. .	This filly was only fit for harness work.

William .. .. was again put into condition, and hunted for another season, going as sound and bold as she was then mated with Montrésor and produced Treasure (see Note above), a light hunter. This is a good example of the value of breeding hunters from hunters to produce weight.

both stout and good-looking. "Persistence," by Beggarman, out of Gluepot, won many first prizes as a hunter brood mare. One of her last colts was by "Ellesmere," by New Oswestry; this colt has recently been purchased by Sir Walter Gilbey as a future sire of hunters. It has three crosses of "half-bred" blood—Beggarman, Ellesmere, and New Oswestry being all outside the pale of the Stud-book—nevertheless three better hunter sires than these perhaps never existed. Having given up breeding hunters for some years, it is specially satisfactory to me to find that so good a judge as Sir Walter Gilbey is carrying on the work, and that my plan of *breeding hunters from hunters* is at last beginning to be more fully recognised.

The mare called Medora, mentioned in above table, went a bad roarer, but she never bred an animal that was touched in the wind. Her produce were first-class hunters, and used to hold their own with the best, in the big grass countries, and with the stag-hounds—a severe trial as to wind! The mare Bloomer (as stout and good a hunter as ever was ridden) was a slight whistler, and at last she went broken-winded. Now two of her produce out of four that were tried turned out bad roarers, and a filly out of her, foaled 1868, being put to the stud at three years old, bred some good-looking colts, but every one turned out a roarer as soon as broken, and they were of course all sold as useless for hunting purposes. The subject of breeding from roarers is a difficult one, but I believe that if a mare should go wrong in her wind from a cold or influenza, or any such cause, it would, if she came of sound parents, be safe to breed from her. But if, on the other hand, it is inherited and runs in the family from any physical weakness in the breathing organs, it is sure to be transmitted to the offspring.

In looking over a carefully kept record of the breeding-stud of Mr. William Blakeway, of Wootton, Onibury, Shropshire, I find that, out of thirty-six colts, eleven were up to 14 stone with hounds; four up to 13 stone; two up to 15; and the remainder up to 12 stone and under. Those up to 14 stone, with three exceptions, were the produce of mares up to 14 stone. The light weight mares nearly always produced light weight stock.

From the accompanying table of particulars of my own experience, it will be seen that the uncertainty of the produce from good hunting mares and thoroughbred sires is so great that breeding is too much of a speculation for farmers to embark in it to any great extent. On the other hand, one great advantage of breeding from hunter-bred sires is, that the produce is nearly certain to have size and substance, and to pay their way as harness horses, or army remounts, if even unfitted for hunting purposes.

## JUDGING FOR THE QUEEN'S PREMIUMS.

Since the foregoing table was first published, the establishment of the Queen's Premiums for thoroughbred sires likely to get hunters has immensely increased the facilities for obtaining the services of suitable sires, but, to be of any real benefit to agriculturists, their number should be multiplied many times, and more attention should be given to their selection. Under the present system of judging, I believe that great mistakes are often made, not from any fault of the judges, but because they have not sufficient information before them. The veterinary examination should ensure the absolute soundness of the animals to which the premiums are awarded; but it is not always the best looking horse, or the one most free from blemishes, which is the sire of the best stock. Although, as is often the case, the judges know nearly every horse in the ring, still they are prohibited from using any knowledge they may have of the individual excellence of the horses before them as stock-getters. My opinion (and I believe others share it with me) is that when a man is called upon to judge a breeding animal, and more especially a sire, he should be furnished with every particular both of pedigree and antecedents, just as if he had to select a sire for his own breeding stud. Those who object to this system say that many men are prejudiced either for or against certain blood, but I think this is not sound reasoning. Is it not safer to trust to the prejudice of men of experience, than to the unknown qualities of an untried stallion? Often have I heard the expression used in the ring, "I know which I should take if I wanted one to breed from myself, but then one can't give him the prize in a show ring." I say the horse that is the best to breed from, is the horse that should have the prize, more especially with regard to Queen's Premiums.

## VETERINARY EXAMINATIONS.

The strict veterinary examination at the London shows has done a vast deal for horse breeding, and the comparatively few unsound horses now exhibited for premiums afford the best evidence of this. There are, however, every year many complaints of certain horses being rejected which had previously taken premiums, and of one set of veterinary surgeons reversing the decision of another set of equally competent specialists, perhaps within a few weeks of each other. This is both very puzzling and disappointing, and some remedy, if possible, should be found. When the problem has been so constantly



worked out by the most competent authorities, it is presumptuous to venture an opinion, which, no doubt, has also been considered by them. I believe Lord Coventry suggested that a stallion, if passed sound at four years old after a racing career, should always be considered so, and be subjected to no further examination. I think, however, that perhaps four years old is rather too soon to arrive at this conclusion, especially as very many race horses that are now found to be useless or unable to stand training as two or three year olds, are "put by" and brought out to compete for the Queen's Premiums as hunter sires, although they have never done enough work to test their soundness. On the other hand, it seems absurd to go on examining horses after they are seven or eight years old, and I should draw the line at this age, when every horse has come thoroughly to maturity. I should have no fear myself of breeding from an aged stallion, for instance, if he were unable then to pass the veterinary examination, provided he could show a clean bill of health and soundness at six years old, and if I knew that he came of parents sound in their wind. I do not believe that stallions which become unsound in their wind late in life transmit that unsoundness, nor that it is hereditary, especially when contracted, as it so generally is, by the system of high feeding and stable management they are subjected to. Old men, and even those only just past the prime of life, get thick-winded and "grunt:" why not horses? If horses were treated more from a common-sense practical point of view, and less by "rule of thumb" and theory, I am convinced that it would be better for everybody. It is very rare to find an old stallion that will pass as absolutely sound from a professional standpoint, but, as I said before, I should never reject a sound-bred horse and a known good stock-getter after eight years old, if he had developed some so-called hereditary disease, which would have been a fatal objection in a young unmatured sire. I may be wrong in this, but if one is afraid to write what one thinks, papers like this lose much of their practical usefulness, and the statement may at least be the means of calling attention to a most interesting subject, and one of the greatest importance to breeders.

I am glad to see that the Hunters' Improvement Society has this year decided to allow horses to compete for their prizes without any veterinary examination at the show, provided their owners can produce a certificate of soundness signed by a qualified veterinary surgeon; but, if the judges are not satisfied, they may call for the advice of those appointed by the society. I advocated this system many years ago, and am convinced that it will work well and save a great deal of

valuable time on the day of the show. The difficulty of handling and thoroughly examining an excited animal, more especially a stallion, must be apparent to every one, and all will acknowledge that it can be done quietly at home much more satisfactorily. The arrangements for the Spring Show hold out great inducements to breeders to send their young stock for competition and sale, and are certain to give an impetus to the breeding of hunter and general purpose horses.

#### HORSE SHOWS AND SALES.

Before leaving the subject of hunter breeding, I would mention two exhibitions which seem to me to be new departures from the ordinary run of horse shows, and likely to do untold good to the cause—I refer to the Compton Stud Show and Sale, and the Earl of Harrington's Show. The lines on which these exhibitions are conducted, are thoroughly practical, and they will go a long way to encourage breeders by giving them a chance of disposing of their horses first hand to hunting men and others, instead of having to pass them through the hands of a dealer. I can speak from my own experience of the valuable work done by the Compton Stud Company in the districts within reach of their establishment. During the last ten years or so in which I have from time to time been invited to judge in Somersetshire and the adjoining counties, I have seen a remarkable improvement in the hunting stock sent for exhibition, and this improvement is without doubt mostly due to the Compton Stud Sires.

#### CHAMPION CLASSES.

I believe that it would be of great benefit if horse breeders could be more encouraged than they are at present. Shows are every year becoming more and more the happy hunting-ground of the "professional showman." The object of all horse shows should be to advance various breeds of horses and to stimulate breeders by giving prizes worth their competing for. It is of course right that the public should see the best animals that can be got together, but the best are not as a rule left long in their breeder's hands, being picked up by people who make it a business to go the round of the shows and take most of the prizes. I should much like to see all horses over five years old, which have won 20*l.* in prizes in one year, declared ineligible to compete except in a champion class. These Champion classes would be most interesting in themselves, and would be indirectly remunerative to the societies establishing them, as the other classes would draw a large entry from those who are now afraid

to enter, knowing they would have little chance of winning when competing against well-known prize-winners. There should be such classes for all breeds—more especially perhaps for “hackneys,” as with the latter the same horses are kept longer at the business than any others.

Hunters, when really of a high class, usually find ready sale to hunting men, and have to take their chance of bumps and bruises during the season, soon getting too stale for the show-yard; but hackneys are often more valuable as prize-winners than for sale purposes, and are put by and “wintered” to be ready for the next summer competitions.

#### HACKNEYS.

The breeding of hackneys has been growing more popular every year, and the great export trade that has been done has encouraged breeders to increase their studs, and has caused the formation of many new ones. The closing of the Hackney Stud Book came as a great disappointment to many who were hoping to get their animals admitted by inspection, and whether this was altogether a wise proceeding or not time only will prove. If, as the most enthusiastic supporters affirm, there was a distinct pure breed of the old English hackney, it must, on the face of it, have been folly to admit any outside mongrel blood which would be calculated to spoil the type. If, on the other hand, the hackney is a term for the animal which in old days was used by farmers and others for their ride-and-drive business horse, then it is to be feared that the inability to take an occasional dip into the thoroughbred cross will tend to deteriorate the quality and more especially the good riding properties of the breed. This class of horse was bred on no regularly distinct lines, excepting perhaps on the dam's side, and was crossed sometimes with a cart, sometimes with a blood, stallion; probably the latter, excepting in a few districts. There are three distinct types of hackneys now being bred—viz., the 15·3 to 16 hands carriage horse; the strong cobby, high-stepping harness horse; and the more blood-like cob of the riding stamp. Now, in my opinion, this is too much for one breed of any recognised type to aim at, and I think that the height of the hackney should not exceed in any case 15·3, and would be better kept down to 15·2. If, however, it is desired to use the hackney for breeding big London carriage horses, this should be a distinct type, and at shows be judged in a separate class. There should also be two classes for those under 15·2; one for harness and the other for hacks. It is almost impossible for the three types to be judged satisfactorily.

together. I cannot help thinking that, of late, extravagant action has been more considered than quality. There should be a stand made against plain heavy heads, small eyes, thick throats, and short necks. The Yorkshire-bred horses are more of the riding type than the Norfolk, and I suppose they owe their quality and finer forehands to the mixture from time to time of the thoroughbred blood. Now that only registered hackney sires can be used, great care must be taken that these are of highest quality and free from such defects as I have tried to describe.

#### YORKSHIRE COACH HORSES AND CLEVELAND BAYS.

The breeding of these horses is very much confined to the county from which they take their name. The stud-books for their registration and the American "boom" came only just in time to save the old Cleveland Bay blood from being extinct. For the best class of London carriage horses, they are no doubt the sort to breed; although personally, I rather prefer the Yorkshire coach horse, from their showing rather more blood and quality, especially in their heads and forehands, giving them altogether a smarter appearance. One of the most beautiful stallions of this breed I ever saw was owned by Mr. C. Wilson, of Rigmaden Park, from whom I bought him at the Royal Agricultural Society of England Show at Nottingham, for a very long figure, for exportation to Buenos Ayres. After a very long and hard fight he was awarded second prize, Mr. Burdett Coutts' "Sultan," a Cleveland Bay, being placed in front of him. "Sultan," perhaps, is one of the grandest specimens of a London coach horse sire in England; but his somewhat heavy crest and head would, in the opinion of many, at that time have scored many points against him, notwithstanding his splendid action. As dams of hunters Cleveland Bays have long been used, and, when mated with thoroughbred sires, produce very good-looking weight-carrying horses; but, for my own part, I always have looked upon their staying powers with suspicion. I well remember looking over a stable of good-looking horses when I was an undergraduate at Oxford, and on asking the pedigree of an exceedingly useful bay mare, the dealer replied: "Oh! that's a Yorkshire bred'un bought at Horncastle Fair," and inferred that she was not suited for my purpose as a hunter, knowing that I wanted one to gallop and stay. A few days afterwards a friend of mine bought this same animal, and I had the pleasure, or rather the pain, of riding her with hounds, and a softer piece of horseflesh I never rode. Harness is the proper place for the Cleveland Bay, and also of

course for the Yorkshire coach horse, but I should not be afraid of some of the best-looking mares of the latter and those showing the most breeding, as hunter dams. No doubt they both come from the same foundation, but the coach horse has been developed from the frequent cross of the thoroughbred.

#### PONIES.

The breeding of ponies is attracting the attention of more people at the present time than at any previous period. The call for good ponies is daily increasing, in fact the supply is not equal to the demand. Shetland ponies have quite a trade of their own, and, having their own Stud-book, special care has of late years been taken with their breeding. They are most valuable for underground work in the mines, on account of their diminutive size; while the best of them find a ready market as children's ponies and for small carriage work. A proof of their value was given at a recent sale of Lord Londonderry's stud, when a little stallion of 8 hands made forty guineas. The Welsh mountain pony is no doubt the best known, and the most capable of being used to improve other breeds. There is nothing that a real good Welsh mountain pony mare cannot produce, if properly mated, from a cob to a high-class hunter. A hunter which owes his descent to Welsh pony ancestors has credentials of soundness and stoutness which cannot be surpassed. The Dartmoor ponies are also being improved, and much attention is now being paid to the Exmoors. These are not, however, kept pure, except by a few breeders.

Regarding the Exmoors, I am indebted to the kindness of Dr. Watney, of Buckhold, Pangbourne, for the following facts:—"Sir Thomas Acland's herd has been kept pure for a very long time, it is said 130 years. They are very handsome and sturdy, and run from 11 to 12 hands. They are usually sold as 'suckers,' and then fetch 8*l.* to 12*l.*, or 15*l.* each if older. I have seen a pair sold for 40*l.*, unbroken. There is a good herd of Sir F. Knight's; his are larger and have been crossed with, I believe, Arab and English pure-bred animals. They are also sold by auction as 'suckers' and fetch from 6*l.* to 15*l.*, or 18*l.*; they run, when grown up, from 12 to nearly 14 hands. Both Sir F. Knight's and Sir T. Acland's herds are out all the year at a great elevation above the sea, and are capable of enduring great hardship and deep snow. When these ponies are broken they fetch quite different prices, as they are remarkably free from vice and extremely enduring." Dr. Watney says of his own animals that they are kept and "treated as wild

animals, that is, the stallion runs with them and they foal entirely by themselves, and almost without loss."

The well-known Westmoreland ponies, brought out by Mr. C. Wilson, of Rigmaden Park, must not be forgotten. In the showyards they have been almost invincible, and, although Mr. Wilson has himself retired from his showyard career, his many years of labour are not thrown away, as Sir Humphrey de Trafford and others are carefully preserving the strain which is so much indebted to the blood of that extraordinary sire "Sir George." The ponies bred on the Church Stretton and South Shropshire hills are of the same type as their neighbours just over the borders in Wales. They are bred in a perfectly wild and natural state on the hills. The annual "round up," which takes place in September, when all owners meet and drive the whole herd into the town of Church Stretton to be sorted and branded, is a sight well worth seeing. A society has been established, and stallions have been imported from Wales for a change of blood. It will thus be seen that there is no danger of the pure pony blood being lost, and, in a few years, the attention that is now being paid to it will bear fruit.

#### POLO PONIES.

This paper has already exceeded the prescribed space, but I cannot close it without mentioning the formation of the "Polo Pony Stud-Book Society" for the "Improvement and encouragement of the breeding of high-class Riding Ponies."

The weight-carrying blood polo pony, not exceeding 14·2 hands, is the type to be aimed at, and just as it is proposed to breed hunters from hunters, so the "Polo Pony Stud-Book Society" is formed for the registration of inspected ponies. These may be the foundation stock of high-class riding ponies, which will, in the course of several generations, breed true to type. The Society has petitioned the Royal Agricultural, the Royal Dublin, and the London Horse Show Societies to establish classes for riding ponies—separate from the hackney or driving pony—as it is quite impossible to judge these two types together, and it is hoped that the suggestion will receive favourable consideration. If the Bath and West and Southern Counties' Society, which holds its shows so frequently in the pony districts, would take the matter up, it would be doing a great good in the interests of pony breeding. The Stud Book Society is particularly anxious to enter mares of the pure pony breeds above mentioned, as it is much easier to breed up from pony foundation than down from miniature horses.

The first exportation to America of ponies suitable for breeding

Polo ponies has just been landed safely; and, as they were accompanied by certificates from the Secretary of the Polo Pony Stud-Book Society, stating that they were entered in the first volume of its Stud-Book, the American Government admitted them into the country free of duty. The breeding of polo ponies is being taken up in America, as well as the game of polo itself, hence there is no doubt there will be a demand for ponies suitable for this purpose; and good riding ponies are of course always wanted.

#### THE EASTERN CROSS.

I have for some years been experimenting on small mountain pony mares, bred on the Church Stretton Hills, mated with Arab and Barb stallions. As far as I can at present judge the cross is likely to be a great success, and I hear from those who have tried the same cross with Exmoor mares that the produce is all that could be desired. Their docility and good temper are most remarkable, and the small ones will be invaluable for children's ponies, as they do not even seem to know how to kick!

I must apologize to the reader for the frequent reference made in this article to my own experience and opinion, but, at the same time, I trust that it may be of some interest to those who are already engaged, or purpose engaging, in the pursuit of "Light Horse Breeding."

#### V.—*The Development of Collegiate Centres for Agricultural Instruction.* By DOUGLAS A. GILCHRIST, B.Sc.

##### PAST PREJUDICES.

IT has long been recognised that people who live in towns are better educated than those who live in the country, hence the supposition that Hodge is not so intelligent as his urban brother. It is very questionable whether the latter supposition is correct, but the truth of the first-named statement may be at once admitted. It is much easier to provide educational facilities for the inhabitants of a town than for those who live in a sparsely-populated rural district, and, consequently, much has been done for the former, and comparatively little for the latter, although this little may have involved a greater expenditure. Several attempts have been made to organise popular

schemes of agricultural instruction, but, till recent years, with so little success that our experienced agriculturists have hitherto looked upon agricultural education as a fad of a few enthusiasts from which neither they nor their families could possibly derive any benefit. In fact, they have regarded it as likely to have rather a reverse tendency, as liable to create a type of gentleman farmer who would spend the greater part of his time in studying books on farming, instead of devoting himself to practical work. There can be no doubt that this prejudice against, what was called, scientific farming was owing to many of the farmers' scientific advisers lacking that practical knowledge which would have very materially altered the character of their advice.

#### PAST WORK.

The work done by the Royal Agricultural College, Cirencester, the Agricultural Department of the University of Edinburgh, and kindred institutions, while it has been excellent and thorough, has been confined to the better class of agriculturists. The part taken in the advancement of agricultural education by the Science and Art Department has been more far-reaching in its character; but while, by means of the local classes in agriculture carried on under its auspices throughout the country, very much useful knowledge has been diffused, still that knowledge has not so thoroughly penetrated all classes of the rural population as is desirable in the best interests of agriculture.

The Royal Agricultural Society of England, following the example of the Highland and Agricultural Society of Scotland, has done most useful work by the examination of agricultural students, and of late years the Bath and West and Southern Counties Society, and the British Dairy Farmers' Association, by initiating and carrying out schemes for the promotion of dairy instruction, have rendered essential aid to agriculture.

#### THE INAUGURATION OF COLLEGIATE CENTRES.

The announcement in 1888 that the Treasury had made a first annual grant of 5000*l.* for the furtherance of agricultural and dairy instruction in this country, marked a new era in the development of agricultural education. This annual grant has not only been continued, but has been increased, and is now under the control of the Board of Agriculture. What may be called University Extension work in agriculture was at once taken up by various educational institutions, notably by the University College of North Wales, at Bangor, and the University of Edinburgh. The energies of the latter were mainly directed



to providing classes in agricultural subjects for schoolmasters, who would afterwards establish and conduct local classes in agriculture in their several districts. The University College at Bangor not only began work of this nature, but adopted a complete scheme of agricultural instruction for the northern counties of Wales, which embraced the establishment of three Dairy Schools, the delivery of Extension Lectures on agricultural subjects at local centres, the conduct of Field Experiments, and the establishment of a complete in-college course of instruction for agricultural students. That the work included under this scheme was successful is shown by the following extract from the Parliamentary Report of the Board of Agriculture on the Distribution of Grants to Agricultural and Dairy Schools in Great Britain for the year 1890-91 :—

“It has been shown that a most complete system of agricultural education can be organised by this College; one which will not only fulfil its own proper duties in the six northern counties of Wales, but form a type on the lines of which it may be feasible to organise systematic agricultural education throughout the kingdom.”

Since the publication of that report collegiate centres for agricultural instruction have been organised at the Yorkshire College, Leeds (for Yorkshire), the Durham College of Science, Newcastle-on-Tyne (for the counties of Durham and Northumberland), and the University College of Wales, Aberystwith (for mid-Wales). The Cambridge and Counties Agricultural Education Committee have also taken steps to organise a scheme, as well as the University Extension College at Reading, which is working in connection with the Oxford University Extension Delegacy. Last year grants from 800*l.* downwards were made by the Board of Agriculture to such centres. These grants have been largely supplemented from the funds now placed at the disposal of County Councils by the Local Taxation Act, 1890, and by the Technical Instruction Acts, while in several cases local subscriptions have also been forthcoming.

#### NATURE OF WORK CARRIED OUT BY A COLLEGIATE CENTRE.

A great part of the agricultural education work now in progress throughout the country is being organised and carried out by County Councils. This work embraces the establishment of fixed and itinerant dairy schools, field experiments, and lectures on agricultural subjects to farmers, and to classes of schoolmasters. Grants are also being given by County Councils to Secondary Schools which have developed an agricultural side (*e.g.*, Ashburton Grammar School), while agricultural scholar-

ships have also been established. The collegiate centres which are subsidized by the Board of Agriculture are able, by means of their staff and equipment, to carry out schemes of agricultural instruction for the County Councils in their districts, and thus to render essential service to those bodies.

The Board of Agriculture, in giving subsidies to central institutions, appears to aim at the following objects :—

(a.) To enable provision to be made by these institutions for complete courses of training for agricultural students.

(b.) To provide for the delivery of courses of extension lectures on agricultural subjects throughout the districts represented.

(c.) To carry out field and other agricultural experiments within those districts.

(d.) To assist in the organisation of dairy schools, travelling dairies, and local classes in agriculture, and to conduct examinations in connection therewith.

I will deal with these objects in the order named.

#### (a) TRAINING FOR AGRICULTURAL STUDENTS.

There are several classes of the rising generation of agriculturists for whom it is necessary to provide suitable courses of instruction.

First, there are the children of the farm labourer and of the smaller farmer. When lads of this class have completed their elementary education, and, let us hope, have passed the sixth standard before leaving a rural school, it is desirable that they should be encouraged to attend an evening Continuation School in which agriculture is taught by a competent teacher according to the syllabus contained in the Code of Regulations for Evening Continuation Schools, lately issued by the Education Department. There can be no doubt that if a boy has received suitable instruction in agricultural processes for a year before leaving a rural school, he will afterwards take a more intelligent interest in farm work. That the syllabus published by the Education Department is a practical and useful one is illustrated by the following extract (sect. 3) from that syllabus :—

“3. THE CROP.—Different crops grown on the farm: (a) Grain crops (wheat, barley, oats, beans and peas); (b) Root crops (turnips, swedes, mangolds, potatoes and carrots); (c) Fodder and green crops (clovers and grasses, tares, grain crops grown for fodder, cabbages, rape). How to know the various crops. Methods of cultivation, sowing and harvesting. How to know the common weeds of arable and grass land.

“PASTURE LAND.—How to keep it in good condition. Removal of docks, thistles, and other weeds. Manuring. Water Supply. Distribution of live stock on summer pasture.

"MEADOW LAND.—General management. Haymaking. The making of silage. When and how meadow land should be grazed.

"INSECT AND FUNGOID PESTS.—How to know those most injurious to the different crops. Methods of prevention."

Although evening continuation work does not come directly within the scope of a collegiate centre, the authorities of a centre can do much to promote the formation of classes for such work by the loan of diagrams or apparatus, by the conduct of field experiments for demonstration purposes, or by providing lectures in connection with the classes. They can render further help by stimulating local effort, and by providing a teacher resident in the district, whose training would probably enable him to conduct such classes successfully. Work of this kind would be materially assisted if the leading farmers of the district would undertake to engage the young lads coming on to their farms from school on condition that they would attend a continuation class. An exhibition, contributed locally, or by the County Council, open to the members of the class, would give the lad who obtained it an opportunity to attend a complete course of instruction at a collegiate centre. The conditions on which a grant is made by the Education Department to such a class are contained in the Code of Regulations for Evening Continuation Schools, 1893.

Provision is also made in this code for instruction in cookery and dairy-work. At the present time, the daughters of farm labourers and the smaller farmers generally prefer situations in towns as domestic servants or shop-assistants, to being dairymaids, and hence there is a scarcity of this class of farm workers. The Education Department has recognised the importance of dairy-work by including it among the subjects for which grants can be earned at a day school or at an evening continuation school. The recognition of such work gives it more importance in the eyes of the children, and, by interesting them in it before they leave school, they will be more likely to turn their attention to it when they look for a situation.

A pioneer class of this nature was organised during the summer of 1892, when Mr. Marshall Dugdale, of Llanfyllin, Montgomeryshire, arranged with the Welshpool Dairy School that a course of instruction in butter-making should be given on his home farm to a class of girls attending the Board School at Llanfyllin. The experiment was a highly successful one, as was evident from the interest taken by the girls in the work and the deftness shown by them after a few days' instruction.

I now come to the education of those who intend to farm, and whose fathers farm on a larger scale than the farmers already referred to. There is a danger at present that the lads

f this class will be encouraged to specialise too early in the direction of agriculture. Until they are at least thirteen years of age, their time should be taken up in acquiring a sound elementary training; and for two or three years afterwards they should not devote themselves exclusively to agricultural subjects. A school like the Ashburton Grammar School offers special attractions for lads during this later period. A complete course of instruction in the agricultural side of this school extends over two years, but scholars are recommended to remain for a third year when possible. The curriculum is arranged so as to combine a thorough general education with scientific and practical work bearing upon agriculture. The experiment now being tried by this school will be watched with interest. A similar attempt will be made by the Dauntsey School, shortly to be opened by the Wilts County Council. After leaving such a school it is desirable, for many reasons, that the student, if he intends eventually to take a college course in agriculture, should spend the next year, or, better still, the next two years, on a farm, and that he should take part in all the farming operations. By doing so he will be enabled, when he begins his college course afterwards, to take a much more intelligent interest in the various classes, and to derive much more information from the lectures. He could undertake a large amount of college work in two winter sessions extending over six months each, and could spend the other six months of each year on the farm at the time when his services would be most valuable there. I am convinced that a very great stimulus would be given to the cause of agricultural education if some County Council scholarships were to be offered for competition to agricultural students who, after leaving such a school as the one above referred to, and then spending two years on a farm, intend to take a college course of instruction in agriculture. All who are watching the progress of agricultural education at the present time must notice that the great bulk of the agricultural students in this country do not ultimately become farmers, although that is the intention of a large proportion of them before they enter for their course of instruction. This is due to the fact that good positions in the teaching profession, and in other departments of agriculture in this country and in our Colonies, attract the agriculturist who has a sound scientific training. In order, therefore, that agricultural education may realise its legitimate object, we must organise a course of instruction in agriculture, such as farmers' sons will be induced to take advantage of, and it must interfere as little as possible with their home life on the farm.

There is still another class of agricultural students, comprising the sons of landowners, intending land-agents and

valuers, and teachers of agricultural science, for whom provision must be made. For these, a fuller course of instruction than that already indicated—although such a course would be an excellent basis—is required. The University of Edinburgh set an excellent example when it decided, some years ago, to confer the degree of B.Sc. in the department of agriculture on eligible students of that University. It was fitting that the University, whose Chair of Agriculture was established more than one hundred years ago, should be the first to take this important step. The example of Edinburgh University has been followed by that of Durham, which makes agriculture a degree subject, and it is hoped that our other Universities will soon move in a similar direction. The new University of Wales and the Victoria University have now excellent opportunities for doing so. In addition to those included in the preliminary examination, the following are the subjects of examination for the agricultural degree in Edinburgh University:—

1. Mathematics, or Biology. 2. Natural Philosophy. 3. Chemistry. 4. Agriculture and Rural Economy. 5. Agricultural Chemistry. 6. Geology. 7. Veterinary Hygiene. 8. Agricultural Entomology. 9. Economic Science as applied to Agriculture. 10. A course in one of the following: (a) Forestry; (b) Experimental Physics; (c) Engineering. 11. Engineering Field-work.

#### (b) EXTENSION LECTURES.

Work of this nature has in some counties met with much success, notably in North Wales and in Yorkshire. The most popular subjects seem to be, "Manures and their Uses," and "The Management of Hay and Pasture." Lectures on Veterinary subjects have also been popular as well as beneficial. When extension lectures to farmers were first suggested, it was thought that it would be desirable to arrange for their delivery on the same days as the fairs and markets were held, but experience shows that this is not the case. On those days agriculturists are too much engrossed in business to give their attention to lectures. Lectures and courses of lectures of this nature have been most successful when delivered in the evening in villages which are agricultural centres, and where it is possible for those attending to walk or drive to them. They are then able to listen to the lectures, and take part in the discussion afterwards, without being hampered by business engagements. Courses of lectures should be delivered, in such districts only as may desire to have them, and where a committee is formed to carry out all the local arrangements. It is

mistake to provide long courses of lectures. Much more good will result from three or four well-attended meetings, in which the interest is well maintained, than from a larger number where signs of a flagging attention become apparent.

**(c) FIELD AND OTHER AGRICULTURAL EXPERIMENTS.**

Experiments of this nature are of two classes, viz., those which are prosecuted for purposes of original research, and those which are intended simply to illustrate results already arrived at. The experiments at the Rothamsted Agricultural Station are the best examples of the former; the fact that their results are so little known among farmers shows the necessity of the latter. Local conditions, such as soil and climate, are so various that it is necessary that experimental stations should be established in every district of the country, in order that farmers may be put in possession of the best lessons that such experiments can teach. Field experiments for purposes of illustration may be carried out at a comparatively small cost when collegiate centres arrange with farmers to give the land and the labour free of cost on condition that the manures are supplied and the experiments superintended from the centre. By such an arrangement the Agricultural Department of the University College, Bangor, was able to carry out during the past season experiments at forty centres in North Wales, and a similar system has been pursued for several years past by the Bath and West Society.

**(d) ORGANISATION OF DAIRY WORK AND OF LOCAL CLASSES AND EXAMINATIONS.**

Dairy instruction is the most important work embraced under this head. During the past few years we have had an extraordinary demand for dairy teachers. It is very doubtful whether this demand can continue, but the fact that good positions have been open has had the effect of filling our Dairy Schools with would-be teachers of dairy work. It may be confidently assumed that, for the best teachers, a few good positions will always be open. There can be no doubt also that there are better openings for women as responsible dairymaids than in many other occupations. There is great room for the further development of dairy businesses in this country, and there is no reason why they should not be kept more in private hands instead of being conducted by limited liability companies. That the market for dairy teachers has not before now been overstocked is due to the fact that when those engaged

in this occupation get married they generally resign such work to others, and this applies to dairymaids also. At the present time it is most important, if dairy education is to be developed as it should be in this country, that the educational standard of our dairy teachers should be raised. The Board of Agriculture, recognising this, arranged for a special course of instruction for the benefit of dairy teachers, which was conducted by the authorities of the University College of North Wales, Bangor, during February, 1893. The experiment was a successful one, and the instruction was fully taken advantage of by those for whom it was intended. The authorities of the University Extension College, Reading, have arranged for a continuation of this class for a period of two months during the spring of the present year. The Board of Agriculture also arranged for the conduct during last February, at the Yorkshire College, Leeds, of a class similar to the one held at Bangor. It is hoped that these classes will lead to the organisation at one or more centres of more systematic and complete courses of instruction in dairy work than have been hitherto attempted. It is natural that the country should look to our collegiate centres for agricultural instruction for the development of work of this nature, and also that such centres should undertake to carry out the examination of dairy pupils.

My own experience, both as an examiner and as an organiser of examinations, convinces me that there should be an oral, as well as a written and practical, examination. By such means examiners can much better estimate the practical and theoretical knowledge of the candidates. For some years past examinations in dairying have been conducted by the British Dairy Farmers' Association, who give ordinary and teachers' certificates for proficiency in the theory and practice of butter and cheese-making, and diplomas for a general knowledge of dairying and dairy farming. The University College, Bangor, gives ordinary certificates for butter and cheese-making, and advanced certificates for general dairy work to pupils of the college dairy schools. In order to gain this latter certificate, a practical examination in butter-making and in cheese-making, as well as a written and oral examination in the various branches of dairy work, and in dairy farming generally, must be passed by the candidate. The Bath and West Society also issues certificates to the students attending its schools.

If the work detailed under the preceding sections is successfully carried out, the intercourse that takes place between the staff of a collegiate centre and the practical farmer can be utilised by the latter in many ways. By the courtesy of the lecturers, he will be enabled to obtain information as to the use

of manures and feeding-stuffs, and upon other scientific points bearing specially upon his own farming operations. Those who have lectured on agricultural subjects know that information of this nature is highly valued by agriculturists when they are confident that it comes from an entirely unbiassed source. But where a teacher or lecturer is also an agent for the sale of implements or other materials, his counsel is, to say the least, always likely to be open to suspicion. The disadvantages and dangers of this have only to be recognised in order that they may be removed.

#### CONCLUSION.

At no previous period in the history of this country has there been a better opportunity for developing agricultural instruction. For the first time, large funds are available for this purpose. Many of the schemes now in operation are of a tentative and experimental character, and if some of them should at first appear to be failures, it is only what must be expected; but, as the work proceeds, experience will point out how it can be carried on more thoroughly and effectively. If we can develop the educational facilities of our rural districts we shall materially increase the attractions of the country, and do much to stem the tide of migration to the towns. I appeal to every agriculturist to co-operate in this work.

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VI.—*Organised Cottage Poultry-Keeping.* By GEO. F. C. PYPER,  
Hon. Sec. of the Exeter and Devon Poultry Society.

#### INTRODUCTION.

THE need of increased poultry-keeping appears to be fully recognised in the present day by all who have studied the subject, the period having passed when it was necessary to argue in favour of its extension, or of the advisability of encouraging our villagers to add it to their other means of obtaining their living. The question of the hour is in what manner or on what lines can this extended culture be simply, profitably, and practically carried out.

Here, in the West of England, poultry-keeping is not in that advanced state in which it exists around London, especially in the counties of Kent and Surrey, where the rearing, fattening, and preparing of poultry for market have become established industries.



The enormous aggregate result of "*la petite culture*," as seen in the statistics of poultry and eggs exported from France and other Continental sources, and produced under that system, naturally suggests the adoption of this industry by the rural population in England, and, on account of certain local advantages, by our west country cottagers more particularly. At the present time it pays the foreign poultry-keeper to maintain some ten millions of fowls to supply our wants, the greater number of which might well and profitably be reared by those who live either contiguously in villages, or, as is frequently the case, in isolated cottages near the high road.

To those who have the real interests of the peasantry at heart, any schemes or suggestions having for their object the extension of poultry-keeping in such instances seem worthy of careful consideration.

#### HOME PRODUCTION.

There can be but little doubt that, under proper conditions, poultry-keeping by cottagers would not only add to the interest in the home, and raise the standard of comfort in it, but would also become a source of pleasure as well as of profit.

No large expenditure is necessary in initiating the requisite scheme, whether promoted by an individual or by a society. In either case, organisation is essential, but not necessarily an organisation of a charitable nature. There need be nothing to sap the independence of those for whose benefit it is intended: the tendency would be rather to give them greater self-reliance and self-respect.

#### COLLECTIVE ORGANISATION.

Perhaps no better example of such organisation exists than that of the Association at Eynsford, in Kent, the details concerning which have been furnished by Mr. E. D. Till, the Chairman of its Committee, to whose energy very much of the success of the Society is due.

The following are the objects of the Society :—

1. To advocate the most approved methods of Poultry and Rabbit keeping, so as to improve the condition of the labouring classes, and at the same time increase the food supply of the county.

2. To advocate more humane treatment of Poultry and Rabbits, which are kept, as a rule, under unhealthy conditions, being badly housed and improperly fed, while the birds are rarely free from vermin, a state which hinders full growth and the production of eggs.

3. To supply to members Poultry and Rabbit foods and appliances in convenient quantities at wholesale prices.

4. To endeavour to facilitate the collection and sale of Eggs, Poultry, and Rabbits in the parish.

5. When the funds admit, to hold a parish exhibition of members' Poultry and Rabbits.

6. To hold meetings, say every quarter, for the purposes of instruction and interchange of ideas with regard to the poultry industry, and to circulate approved poultry literature among members.

The rules of the Society—each member of which is required to pay a subscription of fourpence a month—are framed with the view of practically carrying out the objects enumerated above.

The Association has been an undoubted benefit and success, the balance-sheets being well on the right side, but this result has not been attained without much hard work on the part of the organisers.

Writing on September 6th, 1893, of a visit to Eynsford, Mr. Harrison Weir states that he attended one of the meetings referred to in Object No. 6, and had the pleasure of addressing a very intelligent audience, consisting for the most part of cottagers. He found the state of affairs most satisfactory, the members being anxious to extend the influence and good work of the Association to other villages. The fowls, confined mostly in small runs in cottage gardens, reflected much credit on their owners. The birds kept were almost wholly mongrels, though several of the members had become so far advanced in their opinions that they expressed their intention of substituting a pure breed—the Langshan chiefly—for their present stock.

#### INDIVIDUAL ORGANISATION.

Eynsford possesses a paper-mill, and one or two other establishments, employing a large number of hands, and, in this respect, differs from the purely rural villages in the West of England, where we must look rather to individual than to combined effort to effect the desired result. In fact, in the majority of cases, organisation proceeding from the individual is a necessity to complete success. It is, however, essential that the landowner or other resident of position or leisure should take the matter in hand in order to help at the start those who are willing to endeavour to supplement their wages by poultry-keeping.

Inasmuch as the cottager's space for this purpose is usually limited—though frequently supplemented by that paradise of

chicken, the rough grass border along the road-side—a breeding pen is not advisable in every case, either for the production of healthy and vigorous chickens or from an economic point of view.

The cottager's poultry should consist entirely of hens or pullets, and the owner should be dependent on outside sources for the supply of fertile eggs for hatching.

It is here that one advantage of individual control appears. The breeding pens are then under the complete and sole direction of the organiser, who would obtain the necessary supply of eggs for hatching from a source where the stock had been selected with judgment, and allowed ample space to roam. Chicken would consequently be produced, which, for vigorous constitution and early maturity, would be far in advance of the produce of birds reared in the cottager's confined space.

Perhaps the most suitable place for a breeding stock of one or more pens to supply the requisite number of eggs for hatching, would be a keeper's cottage, or any other detached house, where a good range for the birds would be secured, and which would yet be sufficiently far removed from other poultry to ensure purity of stock.

It will be seen that by this method but few male birds would be required to supply the whole of a village with the requisite number of eggs for hatching, and the waste caused by keeping a cock in every cottager's run would be avoided. Uniformity in the produce, too, is an advantage both to the seller and to the poultry dealer.

In those villages frequented for fishing or other sport, or during the holiday season, visitors would appreciate the quiet which this plan would ensure, and which is a further recommendation to its adoption. It is a generally received opinion, too, that hens in confined runs lay better during the winter for the absence of a male bird, and there is less probability of their contracting the evil habit of feather eating, which birds in close confinement are apt to fall into. Where, however, there is suitable space, and a distinctly expressed inclination to keep a pen of birds with a cock, it should be encouraged. It is always advisable to allow as much scope as possible to individual ideas.

Cottagers already keeping poultry might exchange their eggs for those from the specially selected stock provided; and those commencing could compound for one or more sittings of eggs by returning a chicken for each brood at three months old, and so making the transaction a fair and business-like one.

Not the least important part of such a scheme as is here

outlined is the selection of the variety or varieties to form the breeding pen, which must to some extent be governed by the objects for which the birds are required, whether for egg production or for table purposes.

#### TABLE POULTRY.

Experiments for the past six years with Dorkings, Houdans, Minorcas, Langshans, Indian Game, and their crosses, indicate that the most suitable for the soil and climate of the West of England will be found in a cross of the two last-named breeds. A Langshan cockerel mated with Indian Game hens will, if the chicken be hatched in February, March, or April, produce birds which will in the summer be in every way superior to the ordinary local product, and will fetch a correspondingly better price. Carefully selected birds are absolutely necessary, and the selection should, therefore, be made by one acquainted with the points requisite for the production of profitable table fowls, which should be, at the same time, of prime quality, avoiding as a rule birds bred specially for exhibition. This cross conforms most readily to the requirements of cottagers, in consequence of its adaptability to the confined space available, and its early maturity and consequent excellence on the table. This latter quality is not identical, as many appear to imagine, with another quality which this cross also possesses—that of being a first-rate bird for disposal in the market.

With regard to its table qualities, in the published opinions on birds of this cross, exhibited at the Dairy Show in 1891, it was stated that the birds were fine in bone, with a relatively small amount of offal, and of good flavour. These birds were reared in South Devon. Similar birds from the same yard won prizes in the classes for dead poultry at the Royal and other Exhibitions, and a prize in the classes for cross-bred chickens at the Bath and West Society's Show at Swansea in 1892.

The opinion of one of the largest poultry dealers in the county of Devon, with respect to both its market and table qualities, may also be quoted. He states that he regards the birds produced from this cross as *first-rate* market fowls, for which there is always a demand and consequent good price; while, during the autumn especially, *second-rate* fowls are a glut in the market, with prices too low to afford any margin of profit to the producer. He also states that for fine flavour and delicacy of flesh he has not met their equal, and considers that it would be almost impossible to over-produce birds of this class. These views are confirmed by a large fattener for the London market, Mr. E. Cobb, who says:—"The usual class of poultry bought:

by a fatterer are nothing but mongrels, but of late years, owing to the introduction of pure-bred cocks into rearers' yards, some hundreds of half-Langshans half-mongrels have passed through my hands, and without a single exception that I can remember there has never appeared a 'blocker,' or one that did not fatten well." He further says that the percentage of capons (a term not strictly accurate, but used in the market for prime quality) was fifty per cent. greater with the half-Langshan half-mongrel than with any other cross except one which ran a good second. The most recent confirmation of the advantage of Langshan blood on the male side is the result at Birmingham on November 25th, 1893, when the Champion Prize for table fowls went to a pair of Langshan-Wyandotte cockerels weighing 19 lbs. 6 ozs.

Probably those cottagers who at first are disinclined to believe in the superiority of properly selected breeds, will be converted when they see their neighbour's birds selling at higher prices than their own, and will be convinced that the present farm-yard system of unprofitable mongrelism, which even the frequent introduction of pure strains on the male side fails to wholly remedy, will never help the right side of their balance-sheet. The desired result will only be obtained by the exercise of the same care in selecting stock poultry as that which is found necessary in the more important branches of agriculture.

#### EGG PRODUCTION.

Where the object of poultry-keeping is chiefly, as at Eynsford, to supply eggs, the Langshan is an ideal cottager's breed. It does not unduly fatten in confinement, as Dorkings and the Asiatic breeds do, and the tendency to sit, which is characteristic of the Cochin and Brahma and their crosses, is overcome, in from three to five days, by the use of a coop with a barred floor. Minorcas, Leghorns, or other summer layers will, though laying a large number of eggs during the year, be found altogether out of place in the country where, from March to June or later, eggs are frequently sold at from twenty to twenty-four for a shilling, a price at which no cottager could dispose of them profitably.

In an account, kept from October, 1892, to May, 1893, of the eggs laid by two Langshan pullets hatched on March 23, 1892, it is recorded that they began to lay on October 21 and 25, respectively, and continued up to April 25 and 26, 1893, laying during that period 297 eggs.

The fallacy of considering the number of eggs laid by a hen in the course of a twelvemonth as a criterion of its worth is

shown in this instance. Had the same number of eggs been laid from March to September instead of from October to April their money value would have been little more than half, although the same expense for food and labour would have been entailed.

The attractive colour of these eggs, varying from chocolate to pink buff, is also a matter of consideration to the seller. Though there is no hidden virtue in eggs with brown or tinted shells, they are, as a rule, disposed of more readily than the white-shelled ones. It may be that even the practical housekeeper is imperceptibly acquiring æsthetic tastes which find their outward expression in the choice of a tinted egg.

Next in importance to a properly-selected breeding stock is the question of

#### FOOD SUPPLY.

This is the third object of the Eynsford Association, and, as the supply of food and other necessities at cheaper rates than those generally obtainable may, especially at first, mean the difference between profit and loss, its importance can hardly be overrated. The varied and special circumstances of each village render it difficult to deal with the food supply in general terms, but two points may be particularly dwelt upon. One is the unprofitableness of employing waste or inferior grain of any description for feeding poultry. The other is the importance of buying in bulk instead of in small quantities as required by the individual cottager.

The various supplies necessary to be kept will depend on the

#### METHODS OF FEEDING

adopted. Two errors, of frequent occurrence, both of which are productive of loss and disease, should be noted and deprecated, viz., irregular feeding and over-feeding. With the quality of the meal or corn secured and its price to the cottager kept within a margin of the wholesale cost, there will be but little difficulty in proper feeding—each cottager supplementing his bought feeding stuff with the produce of his garden or allotment and the hedgeside.

Barley-meal, sharps, or bran, mixed with waste potatoes and other vegetables from the garden, should form the first meal each day. The vegetables having been boiled, the meal must be added and given hot, the ingredients being varied as far as possible. Three hedge weeds are valuable adjuncts to these meals—nettles, dandelion, and goose-grass, sometimes called

catch-weed or cleavers (*Galium aparine*). Their blood-purifying qualities (on account of which the old herbals recommend them) render all these especially suitable for birds kept closely confined; and, as during the spring and summer they can be obtained by the children without cost, they should form a considerable addition to the ordinary food, and be given fresh as green food, or boiled and mixed with the meal.

All green food should be fresh and dry (*i.e.* not gathered immediately after rain), and supplied daily. It should be suspended in the run so as to avoid contact with fouled ground, and to afford exercise for the birds in obtaining it. In winter, mangolds may be substituted. This will be a sufficient supply of food until the evening, when either wheat, barley, or oats, in quantity such as the birds will quickly clear up, should be given.

Maize should only be used, and then in a crushed state, during the early summer or at wet periods, in order to hasten the development of cockerels destined for the table. Common unhusked rice may profitably be given in conjunction with the maize.

While no economy is effected by the use of inferior grain, good sound barley of bad colour, when it can be obtained at a lower rate than usual, is a cheap food, especially for winter use.

#### REARING CHICKENS.

The various details of hatching and rearing may well be left to the individual cottager's own experience, the latter being supplemented by what he may learn, as opportunity offers, from his neighbours, or from one of the published guides to poultry rearing. Two very general faults may be pointed out. First, the selection of a dry instead of a moist place for the nest, moisture being a great aid to successful incubation; and second, the mode of preparing the first food for the chicks after hatching. This is usually hard-boiled eggs mixed with bread-crumbs or oatmeal, which, after short exposure to the air, becomes dry, horny and uninviting. Instead of this method of preparing the first food, beat up the egg with two teaspoonfuls of milk, adding sufficient bread-crumbs to make the whole into a fairly moist paste. This should constitute the food for the first few days. It should be followed by groats and small seed, with some animal food when insects, worms, &c. are unobtainable, and some finely-chopped lettuce or onion tops (the latter are more generally known as chibbal tops). In a fortnight or three weeks this can gradually be dispensed with and the ordinary adult food substituted.

As soon as the sex of the chicken can be distinguished it is an advantage to separate the cockerels from the pullets. With the limited accommodation of a cottager, however, this would generally be found inconvenient, if not altogether impracticable. The result of this separation is an increased growth and development, as well as, in the case of the cockerels, better quality of flesh and a more attractive appearance when prepared for table. If this were explained to cottagers, they might in many cases arrange to exchange chicken and each keep one sex only.

The cockerels in each brood should be killed off as opportunity offers, and the pullets reserved for laying. At the end of two years, when they have finished laying a batch of eggs, all hens should be killed, and, if in good condition, as they probably will be, they should in the early spring bring remunerative prices.

#### HOUSES.

In order that no cottager may commence at a disadvantage, the first step should be to see that all existing houses and enclosed runs are thoroughly fumigated, or otherwise cleansed, so as to free them from the vermin pests which do so much to retard growth and egg production. Many poultry-keepers, being unaware of the actual money loss entailed, take no steps to this end.

Where the house can be securely closed, fumigation should be resorted to. Half a pound of sulphur, placed on an iron shovel or old frying-pan, set on fire, and then allowed to remain an hour or more with the house shut up, will be found effectual, and this should be followed by a thorough limewashing, half a pint of paraffin being mixed with each gallon of limewash. All birds occupying such houses should also undergo a similar cleaning process, pyrethrum powder being dusted over the plumage, and well rubbed in under the wings.

Where the houses have to be erected, and there is a choice of situation, a south or south-west aspect should be selected, and a high and dry, in preference to a low moist, spot be chosen, regard being had to the prevailing winter winds in making a choice. If the run, as well as the house, can be roofed over, the benefit to the birds in the winter by reason of the dry shelter afforded will amply repay any extra outlay. Wood, reed, thatch, tarred felt, or (if none of these can be obtained conveniently) corrugated iron may be used as roofing material.

All the ashes available should be sifted into the house and run, and these, with occasional supplies of dry earth, and as much sandy grit from the roadside or stream as can be obtained, will



form an excellent covering to the floor, unless it should happen to consist of cement or brick, in which case a layer some three or four inches thick of finely sifted peat-moss is desirable to maintain a proper temperature, or, in its absence, a thick covering of ashes and leaves.

Cleanliness can only be insured in small runs and houses by the daily removal of excrement, and this can be readily done by the use of a galvanized cinder shovel. To the daily use of this implement may be attributed the fact that, during six years' experiments, in such a space as is usually available for cottage poultry-keeping, and frequently in the opinion of experienced poultry-keepers far too over-crowded with birds, no disease of any kind has made its appearance.

If the cleanliness necessary to profitably keep the birds, and without which it is hopeless to expect to rear them in proper health and productiveness, be observed, it will at once be seen that, however extensively a village population may add to the number of poultry kept within its area, there need be no fear of an insanitary condition arising from poultry-keeping. If, from neglect or any other cause, conditions should arise prejudicial to health, the sanitary inspector could be called in, as in any other matter requiring his attention.

All perches should be wide and rounded on the upper side. The nests should be placed in the darkest place in the house, and both nests and perches should be easily removable, so that the house may at any time be thoroughly cleansed.

A cheaply made and good composition for purifying a poultry house is composed of a packet of "Hudson's Extract of Soap" dissolved in two quarts of boiling water. Pour this mixture into a bucket, and stir a quart of paraffin or petroleum in gradually, so as to thoroughly mix the whole. This applied with a limewash brush, or through the rose of a watering-pot, will destroy all insect life. As disease is caused by impure or stagnant water, it is a good plan to place the drinking vessel on a shelf about a foot high, and in such a position that the sun's rays will not at any time reach it.

#### MARKETS.

Assuming that any preliminary difficulties have been overcome, that the stock birds have been purchased or otherwise obtained, that the food distribution is working satisfactorily, that houses and runs are clean and in good order, and that the chickens are rapidly approaching maturity, the next consideration which naturally arises is how the produce is to be disposed of.

Local considerations must have a paramount voice in determining both the produce itself and its place of disposal. The village poultry-keepers in communication with any of the numerous watering-places around the West of England Coast—on the north, from Weston-super-Mare to Land's End, and on the south to Weymouth—should devote themselves mainly to the object of having their table poultry in perfection when the summer or autumn season—August to October—is at its height. In the case of the winter resorts, the supply of eggs from October to May would probably produce the most profitable results.

Thus birds hatched in March and April would, at five to seven months old, be in considerable request by visitors, and their hatching should be arranged for accordingly, so as to meet the season demand. In cases, however, where villages are too far removed from such places as will readily take their supplies, local custom should be sought. With the superior quality both of birds and eggs produced under the system here advocated, there would doubtless not only be a present market, but a demand would be created which would not be fully satisfied even with a far larger supply than the productive power of cottage rearing would be capable of. Unless the produce can be retailed almost directly to the consumer, much of the profit to the producer will be gone. In Normandy, where besides poultry and eggs, the products of "*la petite culture*" are butter, fruit, vegetables, &c., the prices of the various articles are 20 per cent. higher to the consumer than when first sold by the producer to the dealer.

It is with a view to the reduction of the profits to the middleman, that various forms of co-operative working have been adopted. Where no local market exists and no exceptional demand is found, every endeavour should be made to economically aggregate produce, so as to minimise these profits, and, by sending consignments of poultry or eggs in bulk, to lessen railway charges.

#### BOOKS.

Of late years many small books and pamphlets, suitable for distribution among cottage poultry keepers and small farmers, have been published. Of these, the following would form a useful addition to the literature of the village reading-room or club, or, if distributed among those directly interested, would convey many a useful hint and piece of good advice with regard to the various minor details relating to the construction of houses and runs, and the rearing, feeding, and preparing for market of the cottager's poultry produce:—

"The Cottagers' Manual of Poultry Keeping," by W. B. Tegetmeier.  
Published at the "Field" Office, Bream's Buildings, London, E.C.

"Poultry for the Many." Published by "Poultry," at 171, Fleet Street, London, E.C.

"Roup and Kindred Ailments in Poultry." By W. Vale.

"Fowl Houses." By W. Vale.

"Poultry for the People." By A. Comyns.

The last three can be obtained from the "Feathered World" Office, 273, Strand, London, W.C.

VII.—*Cider-Making*. By JAMES HARPER, Ebley, Stroud, Gloucestershire.

OF all the operations of farming, there is, perhaps, not one which is so little understood, about which there is so much that ought to be learned, and which, if well carried out, would be so profitable to the farmer, as that of Cider-making. The artist travelling through the country, finds admirable subjects for his pencil in the old-fashioned "horse cider mill," and "reed press," both very strong, and both very well in their day, when the idea was to make cider "for the men;" but these appliances are now as much out of date as the old stage-coaches which ran between London and Exeter.

Attention has been paid in isolated instances to the manufacture of cider in this country, but to a far greater extent (as is usually the case) in America. There has not, however, been anything like an organised and recognised attempt to make good cider on scientific and hygienic principles, as has been done with butter and cheese.

All my life I have given much attention to the making of cider in its various stages; and I am of opinion that, before the end of the century, we shall see in England what may be termed a "wine" produced from apples, which will bear comparison with the best productions of Germany.

In the scope of an article like this, it is impossible to go into every minute detail with reference to the manufacture of cider. It would require a book rather than an article to treat the subject in such manner. My object here will be to give the outlines merely of the whole system, laying stress as much as possible upon the essentials necessary to improve the fruit upon the farm, to ensure the better management of it, to convert it into cider, and to keep the latter in such manner that it shall, when ready for sale, be worth at least double its present value, both intrinsically and as a national beverage.

My purpose is to enable farmers, by the exercise of a little ability, and a good deal of care and watchful attention, to make thoroughly good cider. I do not profess to write from either a scientific or from a theoretical point of view, but simply as a practical man with a practical method of turning apples into good cider.

#### THE FRUIT.

There is an old tradition that good cider fruit is not fit to eat. Let it be clearly understood that for making either sweet or dry cider, the more saccharine (sugar) the fruit has in it the better, as it gives to sweet cider more sweetness, and to dry cider more strength. At present we have in this country no opportunity of finding out through the agency of any Government Department the relative merits of the different kinds of fruit at our disposal for the purpose in question; and until this is forthcoming, the British farmer will be heavily handicapped in the manufacture of cider as compared with his French and American contemporaries. No pains should be spared on the part of the representatives of apple-growing districts to induce the Government to issue authoritative particulars, giving the correct as well as the local name, colour, general characteristics and chemical composition of every apple and pear grown in this country. It will be found that some apples contain more saccharines, some more fixed acids, than others. Generally the sweeter apples are eating apples, while those containing a large percentage of acid and a small quantity of sugar are known as cider fruit.

It will be impossible, until such particulars are furnished, to give any reliable statistics of the English apple, therefore my remarks on this head must be more or less of a general character. With a view to keeping up a standard of size, I advocate picking out the largest and finest fruit of all table and culinary varieties, and sending only these to market, all the smaller sizes being reserved for the cider mill.

With regard to cider fruit itself, a good deal of it in all parts of the country is taken from old trees that are dying from want of attention. Now by no exercise of either ability or genius can such fruit be made into thoroughly good cider, and the attempt will only dishearten the maker. I will here say a word or two upon

#### THE TREES.

Apple trees, as a rule, and apple growing and orchards generally, receive but little attention. Some time ago I went into an orchard in Devon which was literally going to ruin.

The branches had become interlaced, the trees not having been pruned (so the farmer told me) during the time he had been on the farm, some fifteen or sixteen years. The branches and trunks were covered with lichen and moss, and the older trees were quite full of dead wood. Fruit from such trees will never make good cider. It must, once for all, be understood that the trees in an orchard need to have care and attention given to them, just as do cattle and sheep. They must be pruned; if necessary, the bark must be cleared of lichen and moss; and plenty of either stable manure mixed with water, pig manure, or some other kind of strong fertilizer, should be put round the stems of the tree as far as the branches extend. The best method of cleansing the tree from lichen is to syringe it with about one-eighth of a pint of paraffin in a gallon of water. This is best done in March. But if the trees are well looked after, so far as regards pruning and manuring, lichen will have a very poor chance of thriving. Encourage health, and you discourage disease.

A friend of mine has some strong hurdles, so made that they will fold together for the purpose of being put upon a cart or waggon, and can be easily removed from place to place as required. He sets these up round the apple trees, and turns his pigs into the ring thus formed, for two or three days at a time, and he certainly produces some very fine fruit, and some very large crops.

When the fruit begins to ripen, which it does as a rule in October, it will be noticed that some apples fall apparently ~~ripe~~ before the main crop shows any sign of ripeness. These apples are generally wasp-eaten, or have had a maggot at work in them, in which case the fruit had better be ground before it turns rotten, or sold cheap, as it usually is, as the product of windfalls, or put to some other use if any other use can be found for it. If, however, the juice of this fruit is allowed to stand in the vat for a little while, and is then put into a barrel with the bung out and allowed to ferment, it will turn into splendid vinegar, which seems as good a way as any of dealing with it.

When the apples on the trees, after these windfalls have come and gone, show signs of ripeness, which is usually indicated by the turning of a green apple to a yellow tinge, and of a red apple to a slightly pale pink, it is time to gather them. By the old practice of allowing a man with heavy hob-nailed boots to get up and walk over and excoriate the sensitive bark of the trees, a great deal of damage was done, whilst the twigs and smaller branches also suffered, owing to the violent way in which the tree was shaken in order to get the fruit. The proper way is to use what is called a "harvest blanket,"

a crook at the end of a pole to shake the fruit into the net.

A "harvest blanket" is a square or round sheet, large enough to go outside the extreme ends of the branches of the tree.

It is usually made of "ticking," which can be bought cheaply, and a rope is run round the outside. A slit passes away up to the centre, where a round hole is cut to allow the net to go round the trunk of the tree; rings are stitched in on both sides of the slit to this centre hole, to enable the two ends of the slit to be laced together. Stakes are employed to hold the edges of the blanket from the ground a little, and thus



to throw the bulk of the fruit into the centre of the sheet. The person stands outside this blanket, and carefully putting the crook over each branch as he comes to it, shakes off the fruit into the net, as gently as possible to avoid bruising, while the raised edges of the blanket cause the fruit to roll into the centre. This description can be best understood by reference to the above reproduction of a photograph of the sheet when in use. When all the fruit is gathered, the slits are opened and the edges of the blanket manipulated, so as to bring the fruit together. One man and a boy get perfect in this work, the apples are collected quickly and cleanly, and with little harm to

the tree; while the fruit will be incomparably better for the purpose of cider-making than if gathered in any other way.

The "harvest blanket" will cost from 25s. to 40s., according to size, and will last with care for a number of years. Some farmers have used them to my knowledge for some years past; their fruit is always cleaner than that of others, and they say that the only matter requiring special care is the keeping of the leaves out of the blanket. I have never known a farmer who had once adopted this method of collecting the apples go back to the old way.

When the fruit has been gathered, there comes the question of

#### STORAGE.

There is more harm done every year by bad storage than by all the other defects in the old method of cider-making. The most common way is to fling the fruit into heaps in the orchard. Some put it indoors in lofts. Some few put it upon straw. I have tried all these ways, but have come to the conclusion that the cheapest and best method is to use

#### HURDLE STORES.

Every farmer has sheep hurdles upon his farm, which are only fully in use during the lambing season; in any case they cost but little. When the fruit is about to be gathered, drive a hurdle into the ground, strengthening it, if it is a high one, by driving a stake into the ground by it. Another hurdle should then be placed parallel to the first, and sufficiently near to allow of another being placed like a shelf upon the bottom rail of the first hurdle, and the second rail from the bottom of the other hurdle. A hurdle should be driven in at each side, and the series may be continued an indefinite distance. Some use wreath hurdles, made of willow with twigs interlaced between the bars. Others use a thick coating of straw or fern on the bottom, with some straw turned up at the sides to keep the fruit from running out. The illustration opposite shows the hurdle store from one end. When the produce of a tree, or of several trees of one sort, has been gathered, it is put into this receptacle, which, as will be evident, is very easily put up. Apples stored in this way, either in rain or sunshine, will keep longer than by any other method I know. They are kept off the ground, and the air can get under, over, and round them. Premature decay is arrested, and the earthy taste, so common in cider made under the old system, is entirely prevented. The fruit undergoes what the French call the *grand ripening* process, that is, it loses some of its moisture, and so concentrates and increases the value of its

saccharines; hence fruit stored in this manner is immeasurably superior for its intended purpose than that stored in any other way.

The microscope, that indispensable adjunct to the laboratory of the cider manufacturer, shows that the apple stored upon the ground absorbs in its sensitive skin the characteristics of the earth on which it has lain. The same is true of its storage on straw; but apples stored in the way described above



develop a larger share of pure yeast germs upon the skin, with comparatively few counteracting bad influences, and this gives a better and healthier fermentation to the juice.

When the cider-maker finds upon examination that the apples in one of these "crèches," as they may be called, are fit for turning into cider, he will taste the fruit. If it manifests a strong proportion of acid or bitterness, he will then know *that this particular apple is not, used alone, a fit one from which to*



*make cider, but must be mixed with an apple that has a sweet and pleasant taste.* The two together will give a desirable and medium amount of acid and sugar. A better method, however, is to scrape on a nutmeg-grater half-a-dozen apples of the variety to be tested; place the pulp thus obtained in a cloth and press out the juice into a glass. This can then be tested with

#### THE SACCHAROMETER.

This instrument is exactly similar to an ordinary lactometer, but the graduations on the stem read from 0 up to 50, that is from 1.000 to 1.050, or it may be graduated to show the percentage of sugar. The value of this instrument to the cider-maker is well shown in a book upon cider by Mr. J. M. Trowbridge, an American author, whose views may be summed up as follows:—The figures on the stem of the saccharometer indicate the amount of sugar the juice contains. Thus, when the instrument is put into water, the water would come up to the line against which was the “0.” If to the water there were added a definite quantity of sugar, the saccharometer would rise, and the level of the liquid would be opposite one of the figures between 0 and 50. At different temperatures the readings of the saccharometer vary for the same quantity of sugar; for instance, if the saccharometer showed  $14\frac{1}{2}$  per cent. at a temperature of  $73\frac{1}{2}^{\circ}$ , there would have to be added a half per cent. to give the true strength of the sugar, namely 15 per cent. If the thermometer showed only  $42\frac{3}{4}^{\circ}$  Fahr., it would be necessary to deduct one-half per cent., so giving 14 per cent. as the true reading. At a temperature of  $60^{\circ}$  the reading of the saccharometer would be absolutely correct; so, in order to avoid confusing the mind of the would-be cider-maker with unnecessary readings, we may say at once that you can only depend upon the saccharometer being correct at a temperature of  $60^{\circ}$ . The saccharometer shows the absolute amount of solids held in solution in the juice; the real amount of sugar is not actually shown. The acids and other constituents of the juice, as well as the true amount of sugar, affect the reading of the saccharometer. In good seasons the ordinary eating or culinary fruit when thoroughly ripe would show from 8 to 15 per cent. of sugar, in addition to other solids. It would contain an amount of fixed acids (that is to say, the natural acid of the apple) which would be less than 0.5 per cent., in other words, there is less than  $\frac{1}{2}$  per cent. present. Cider made from fruit like this would lack tartness, and when the juice was first expressed it would have a preponderating taste of sugar. There is a method by which the actual amount of acid present in the juice can be estimated, but it requires

very careful manipulation ; yet the apparatus would, I think, be absolutely necessary to the cider-maker who wished to attain the highest success. While I believe that occasionally sufficient fruit of one sort may be found for cider-making, I am convinced that the great mass of second and third rate fruit now grown all over the country cannot be profitably used alone for cider, but must be mixed with other fruit of better quality before grinding. I hope the day will come when all the old cider trees will be eliminated from the English soil, and when we shall be able to make our cider from the small fruit and deformed rejections of our eating fruit. Until we do this our cider will not compare with the cider made in other countries.

#### THE GRINDING.

The cider-maker having blended his apples to the best advantage, so as to obtain the maximum of saccharines and the minimum of acids, the next operation is grinding.

There are different methods of grinding at present in use. First, there is the old stone mill, which has the disadvantage of involving a very long, laborious and dirty process. It certainly does crush the apples thoroughly ; but a modern mill will grind as much in one day as one of these old stone mills can manage in twelve. Another kind of mill is made of two iron rollers so cast that they fit into one another. These iron rollers, in my opinion, do not separate the cells of the apple sufficiently ; the mill simply crushes the fruit, and in no sense of the word can it be said to disintegrate it properly. Yet another kind of mill is the "Tooth mill," having two stone rollers under it. In the top set of rollers the teeth of one roller fit into openings in the other. These mills do their work fairly well, but a still better mill is the one called a "Scratcher." It is the best, for this reason, that it disintegrates the apple cell from cell, and does not crush or break the pips or kernels, which I think is a distinct advantage. I used to have two stone rollers under a "scratcher," but have now rejected them. The scratcher tears the fruit to pieces ; will obtain more liquor to the ton weight of fruit than any other system of grinding I have tried ; and has the immense advantage of grinding as fast again as any other mill known. I have found it advisable, where possible, to get the mill on an upper floor, and run the fruit through the mill and thence, through one end of the trundle under the mill, into the press direct. The mill should at all times be scrupulously clean, and before every grinding it is well to cleanse the whole of it with either wood ashes and water, or bisulphite of lime and water, which should be kept in a cask ready for the

purpose. This substance may also be used to cleanse tubs, if any are used, and every other receptacle into which the pomace goes. Should any of the wooden portion of the apparatus become decayed, it must be replaced, for the sensitive pulp of the apple will invariably take up the slightest taint.

#### PRESSING.

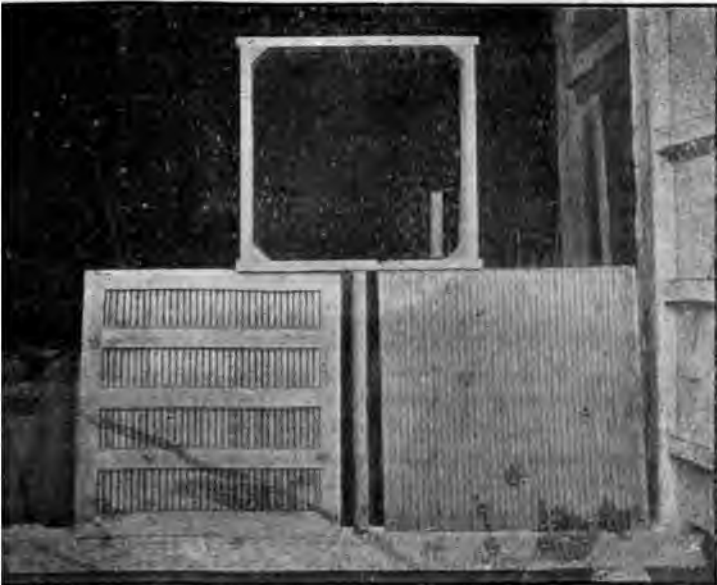
There are many kinds of presses sold, but any one of the nine or ten varieties commonly used will serve the purpose, without any explanation as to form and style being required. As I said before, the "must" should run direct from the mill into the press, and in the case of small makers, where not many hands are available, it is as well to have a travelling double-bedded press. I know a cider maker in Gloucestershire who has used a double-bedded press for years, and it does the work of two presses easily. He puts up a cheese, presses it tightly, and, while it is running dry, puts up a second cheese, which, when the first is dry, is run into position. The advantage of this is that while one lot of juice is running out, another "cheese" can be put up. The old-fashioned way of pressing adopted in Somerset and Devon is to use what is locally termed a "reed" press, which consists of clean (?) straw, then a layer of must, then another layer of straw, and so on, until the "cheese" is made up; the latter is then allowed to stand for two or three hours and is afterwards slowly pressed. The ragged outsides having been cut off with a hay knife and put on the top, the whole is then pressed for a day or more till fairly dry. Inquiries of persons who have been in the habit of using these presses, as to their reason for doing so, always result in the same reply—"custom."

The best way of putting up a "cheese" is to have a square frame or mould, which is made of wood, about 3 feet square and 6 inches deep, and in this put a square cloth of manilla, cocoanut-fibre, or horse-hair (I prefer the first), with the edges of the cloth about 10 to 12 inches over the form each side. When about 3 inches of must are spread over the cloth, lying within the mould, the sides of the cloth are folded over from corner to corner, and then the corners are folded in towards the centre, taking care that the must is pressed down tightly all round. This operation is shown in the following illustration.

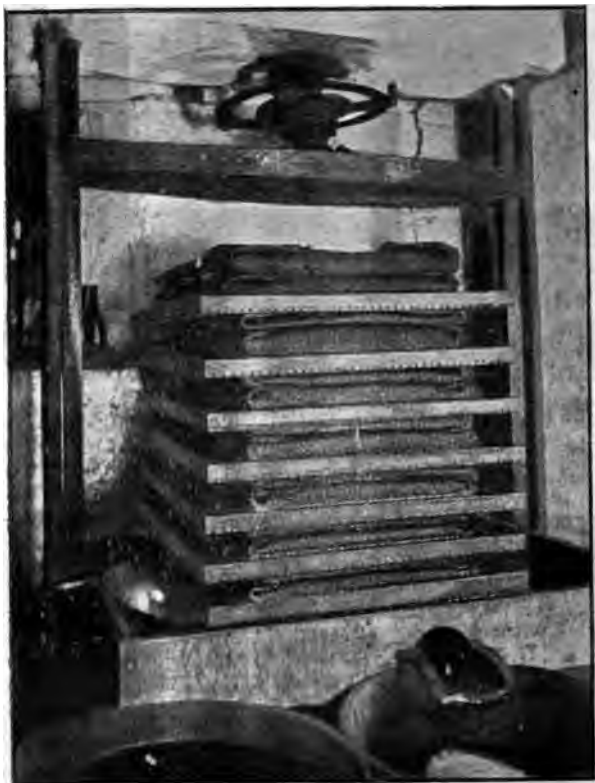
Another cloth is now put on over that, and so on till the cheese is put up. To those who do not mind going to the necessary expense, it is advisable to use between every two cloths, a board or rack—the rack is the better of the two. This rack is a wooden square, dished slightly at the sides in order to allow the cloth to be completely pressed out, and having thin



s of lath at the bottom, so that the juice can run out. The  
owing woodcut shows on the top the mould, and below,  
sides of one of the racks.



The advantage of these racks is that greater pressure is obtained and, consequently, quicker results, than without them. Experience shows that by the use of these cloths and boards you can get *perfect cleanliness, a much larger yield, and greater speed*. The following illustration shows a "cheese" so prepared and ready for pressure to be applied.



By the use of these racks it is possible to get the cheese thoroughly dry in two or three hours, while it would take a day, or a day and a half, with the old reed process. It is essential that the liquor should be extracted as quickly as possible, for any delay in getting the liquor from the must is provocative of fermentation, which is prejudicial at this stage of the manufacture.

With regard to the exhausted must, a good many methods are in vogue for utilizing this. Some farmers give it to the pig or cows. By using hydraulic machinery, I always get *min* dry enough to burn in the furnace under the boiler as fuel.

requiring but little coal with it, and the ashes are carefully put under my apple and other fruit trees. They make an excellent manure for these; in fact, you put the product of the trees back upon the land whence it came, and thus very little is lost. I have not found the must of great advantage as food for animals, nor can it be considered, as a rule, a satisfactory article of food, unless used immediately on coming from the press and before becoming acid.

The juice which first runs from the press is undeniably the best, and for this reason—having come out first, it comes from the cells most easily broken, which are the ripest. The first juice yields more saccharine matter, and, if carefully looked after, is the best juice that will be obtained from each pressing. The second juice is not so sweet as the first, and the last running from the press is the least sweet of any. This is because it takes a much greater pressure to get the juice out of the unripe cells of the fruit; hence the juice so obtained is itself unripe, and contains less saccharine matter. It is advisable to heat this juice, and I have never found this fail to make the juice sweeter. Heat appears to turn the substances in the unripe juice into saccharine matter.

The kernel or seed of the fruit contains essential oils, which are not at all agreeable to the taste, and under the influence of heat, in the subsequent stages of cider-making, are apt to become rancid, and impart a cloudiness to the liquor. Moreover, I have found so many cases where farmers who crush the kernels have complained of having “ropy” cider, that I am inclined to believe that this may be partly due to the crushing of the kernel. The skin of the fruit contains, I believe, all the essential oils required.

#### PURIFICATION OF THE JUICE.

The old method of treating the juice after it came from the mill was to put it in barrels in the cellar, and let it take its own course. If the resulting cider turned out all right, either sweet or dry, as the season and weather might allow, the farmer was satisfied; and if it turned out wrong, well, it could not be helped. The wonder to me is that it ever did turn out good cider under such a system. Of course I do not here allude to makers who “rack.”

All the means described, so far, are only the elementary parts of cider-making; the true essentials follow. The juice as it runs from the mill contains water, sugar, some acids, and the germs of fermentation. Where the make has been characterised by carelessness in the storage and pressing of the apples, the

juice is certain to contain wild yeast germs, and various organisms, especially bacteria, which will afterwards prove detrimental to the cider, and destroy any good qualities it might otherwise have had. To purify the juice, so far as possible, from all extraneous detrimental matter, the best course is to resort to

#### FILTRATION.

Directly the cider runs from the press, pump it into a vat, and from this vat run it through bags which filter all the detrimental matter out of it. A little skim milk—about a quarter of a pint to a bag that will hold, say, 15 to 20 gallons—is first added to the cider; this curdles and causes a coating to form on the inside of the bag, and the cider runs out of the bag not only bright but brilliant. This is the best and most successful way of filtering I know of. Some people have tried sand, charcoal, blood, and different kinds of filters, but I believe that an ordinary bag of cotton, or some coarser material when the cider is full of saccharine matter, is the best medium for filtering. This filtering takes none of the saccharine matters out of the juice, but, if successfully carried out, it does remove all the organic impurities; and the juice, when deprived of these, but with all its saccharine left in, if run into a perfectly clean cask, will ferment into a thoroughly vinous liquor. In a very cold season it will be found that the juices after this purification ferment very slowly. This is as it should be, for a wild or tumultuous fermentation is most harmful. The cider at times may not come through the bags promptly, and in some cases this is due to want of care in the former stages of the process. If the cider has taken a long time to press, fermentation will have set up in it, and the liquor when in a state of fermentation can hardly be got through the bags at all. If the cider will not go through the filter, the only thing to do is to put it into casks. Here allow it to ferment of itself, but keep the cask filled up every day, so that whatever scum may rise during fermentation, shall come over the bung-hole, and not be left in the cider to make it worse. This cider will not be as good as if filtered, but it will, at any rate, be better for the care bestowed upon it up to this stage. The cider that can be filtered should be subsequently run into thoroughly clean, sweet casks or barrels.

#### FERMENTATION.

Where little care is taken, the fermentation of the English apple juice is a very varying one; for instance, when the fruit is allowed to lie on the ground, a wild tumultuous fermentation

often ensues, which can never be considered in any way satisfactory. The cause of a pure fermentation is the yeast germ which is found on the skin of the apple. As I have already pointed out, the skin of the apple is affected by the material upon which it is stored; therefore the fermentation will be more or less impure with any of the old methods of storing to which I have referred. But after careful filtering there is, as a rule, nothing but the pure yeast cell left in the juice, nothing to operate injuriously. This causes a moderate, regular, and highly satisfactory fermentation, and none of the so-called "tumultuous" fermentation, so noticeable in unfiltered cider. If the cask in which the cider is put is unclean, that uncleanness affects the fermentation. Even the most minute particle of decayed wood will affect the fermentation prejudicially. On the other hand, if the cask is perfectly clean the cider takes its normal course. Cider will ferment at a temperature of 34° or 35° Fahr., and the higher the temperature and the more saccharine the juice, the more powerful the fermentation will be. Cider in process of fermentation should be watched very closely; indeed, if not watched, it may develop bad characteristics in a very short space of time. For instance, the finest cider may rapidly be converted into the finest vinegar. The farmer who knows how to treat cider in all its states should be able to foresee and check any wrong fermentation which may arise.

When the maker has got his cider in the casks, he will notice that some of it begins to ferment very rapidly. This fermentation will have to be stopped, or, as is usually the case, a second or acetous fermentation will set in, which will turn the whole product into vinegar. When the maker finds, by just lifting out the bung (which must not be firmly secured), that fermentation has commenced, a decided fizz being audible inside the cask, he should fill up to within an inch or so of the top with filtered cider and keep it so filled every day, but not quite full, as before advised in the case of unfiltered cider. If in the course of from one to four months (according to the season, the character of the fruit, and the heat during fermentation) the cider is tested with the saccharometer, it will be found that the gravity gradually becomes less; the cider has lost some of its sugar, and by the conversion of this sugar has increased in alcoholic strength.

Let us suppose, for the sake of illustration, that when the cider was first made it contained 15 per cent. of sugar, though as a matter of fact it will not often have so much as this. If in January, say, the saccharometer shows 5 per cent. of sugar left, the remaining ten have therefore been turned into alcohol.



The cider should then have, as nearly as possible, 4 per cent. of alcohol and 5 per cent. of sugar.

It was found by Pasteur that 15 per cent. of sugar would produce  $6\frac{1}{2}$  per cent. of "alcohol." If all the sugar in a certain lot of juice showing 15 per cent. of sugar is turned into alcohol, the cider will then be dry cider. If there were more than 0.5 per cent. of acid in the original juice, or, in other words, if the acid was strongly noticeable to the taste at the time the juice was derived from the test apples, there would then be a preponderance of acid in the cider, which would make it unpalatable to the vast majority who drink cider, and therefore unsaleable. To make it saleable, it is necessary to keep this cider with less than  $6\frac{1}{2}$  per cent. of alcohol, say with only 3 per cent. or 4 per cent., and with the remaining sugar left in the cider.

But now comes the question of how to keep it in that state so that it will not "turn off." This has been a puzzle for many years to every maker of cider, whether in large or small quantities, and is still a puzzle to the majority. But the difficulty can be got over, and easily, in the case of still bottled cider, by the process of

#### PASTEURISATION.

Pasteurising is so called from its discoverer, M. Pasteur, the great French scientist. He found that wine, beer, cider, &c., when subjected to certain heat, varying according to the nature of the liquid, had all the germs it contained which excite fermentation destroyed; and by destroying the cause of fermentation, any further change in the liquid, if it be properly sealed and secured, is prevented. It must, however, be distinctly understood that the Pasteurisation of cider succeeds best when the fruit has been properly kept, has been well ground, without the kernels having been crushed, and when the filtering has been done thoroughly.

Cider made of good fruit well handled, according to the foregoing directions, and containing 5 per cent. of sugar and 3 or 4 per cent. of alcohol, can then be put into bottles and securely corked. The bottles should be placed cork downwards in a bath, saucepan, or any other receptacle, and cold water be put upon them. Heat should be applied, and the temperature of the water raised as quickly as possible to from  $140^{\circ}$  to  $160^{\circ}$  Fahr., and then allowed to cool down to its original temperature. The heat of the water outside the bottles should never be higher than  $160^{\circ}$  Fahr., nor should it be kept at that temperature longer than five minutes, otherwise the contents of the bottles will acquire a cooked taste. The heating

should be done as quickly as possible, and directly it is finished the bottles should be taken out and stored in an even temperature. If they are placed in too low a temperature, the bottles will burst. Cider so bottled has no effervescence; it is perfectly clear, or will be if the kernels have not been crushed.

To Pasteurise cider in bulk, without allowing it to come into contact with the air, presents more difficulty, which, however, has, I think, been overcome. A machine is in process of manufacture to Pasteurise forty gallons every fifteen minutes without allowing the liquor to come into contact with the air. The machine is simple and effective, and easily managed. The cider is taken from the cask, heated to a temperature of 160° Fahr., and immediately afterwards cooled to the temperature at which it came from the cask. The apparatus will be made in various sizes, capable of Pasteurising from ten to one hundred gallons, so that it will be within the means of the smallest maker. The great difficulty in Pasteurisation is that, unless great care be taken not to let in the air, the effect of the system is entirely nullified; but, where properly conducted, this process of Pasteurisation is the best and most effectual, as well as the cheapest, method of preserving cider. All other methods of preservation depend upon the use of chemicals, some of which leave their unpleasant traces in the cider to which they have been introduced, while others are injurious to health. After the addition of a bottle of good sound cider to the Pasteurised cider, which will cause it to gain fresh vigour, it must be stored in casks that are thoroughly sound. The bung must be driven tight so as to hermetically seal them, and the outsides must be coated with a preparation of paraffin. Old cider is the best material to place in the Pasteurised cider, though a bottle of wine may be used instead. The next process which the cider undergoes is that of

#### RIPENING.

This can only be done with time. Cider containing the proportions of sugar and alcohol already mentioned in this paper, will, after Pasteurisation, keep sound—by “sound” I mean sweet and free from taint—in the cask in which it was originally stored, for one, two, or three years, in accordance with the conditions of the storage. There will be no sediment, it will be in the “pink” of condition, there will be an agreeable sparkle, and it will not suffer by transit.

## CONCLUSION.

Such is the process of cider-making adopted by myself and others whom I have assisted to carry out the views herein stated. It is possible that the ordinary reader may say that there is too much trouble in all this, and that the result is not worth it; but as a cider merchant, my opinion is that to improve the character of cider, and so enable the vendors to procure a better article, and one of the good quality demanded by the public, is worth a little trouble on the part of the makers. In fact, the only way to secure for cider the position which it ought to hold as a national beverage is to make it fit for people to drink.

Much of the ordinary cider made to-day is almost undrinkable, yet I believe that farmers can, if they like to give the time and trouble to it, make upon their own homesteads from their own fruit a thoroughly excellent cider. There is no reason why the attempt should not be made. Let every maker of cider do his utmost to turn out a better article. In this paper I have endeavoured to indicate the lines upon which improvement should proceed. If the directions given are carefully followed with intelligence and patience I believe they will enable farmers to make more profit out of their orchards than they have ever done before, and will, in fact, make the manufacture of cider an important branch of the farmer's business.

VIII.—*Observations on Cider-Making.* By F. J. LLOYD.

I HAVE watched, on behalf of the Bath and West and Southern Counties Society, some experiments in cider-making, on Mr. Harper's system, conducted by Mr. Neville Grenville, at Butleigh, in Somerset, and the following scientific observations in relation thereto may be useful.

In reporting upon these observations it will be advisable to follow the same order as the subjects occupy in the preceding paper.

## THE FRUIT.

My first work was to determine the composition of the apples most common in the neighbourhood. Great difficulty was at once found from the fact that no two farmers called the same apples by the same name. This is well shown by the fact that two apples, different in appearance and in composition, as

seen below, were both called Royal Somerset. In some instances it was not possible to find any name for the apples grown.

The few following analyses show that there is great difference in the quality of the apples and in their value for cider-making; moreover, it is also highly probable that with a different season, these same varieties would be found to have a different composition. The tests were made in the juice expressed from six ripe apples which had been thoroughly grated.

## ANALYSES OF APPLES (JUICE).

Name.	Specific Gravity.	Total Solids including Sugar.	Acidity.	Locally reputed to make—
Court of Wick .. .. .	1·053	13·0	·65	Good, but thin cider.
Royal Somerset (Bethell)	1·055	13·5	·60	Poor cider.
New Cadbury .. .. .	1·0574	14·0	·16	Very good cider.
Denheim Orange .. ..	1·0611	15·0	·60	{ Only moderately good cider.
Green Roller .. .. .	1·0624	15·2	lost.	Poor cider.
Tom Hooper .. .. .	1·0632	15·4	·72	Poor cider.
Red Jersey .. .. .	1·068	16·5	·20	Very good cider.
Kingston Black .. ..	1·068	16·5	·32	{ Better cider than New Cadbury's.
Hins .. .. .	1·075	18·1	·39	Very good cider.
Royal Somerset (Silcox, Jr.)	1·072	17·5	1·58	{ Poor cider, quite colour- less.
Horners .. .. .	1·065	16·0	·62	Fair cider.
Bethell's Variety .. ..	1·0573	14·0	·20	Excellent cider.

## THE SACCHAROMETER.

So far as my experiments go, the saccharometer is not a reliable instrument for testing the amount of sugar in the apple juice. The fact is that it only shows the specific gravity of the liquid tested, and this does not appear to be in direct relation to the amount of sugar present. This is borne out by the results of others, and if any table is studied which gives both the specific gravity of the juice and the percentage of sugar, it will be found that the two do not agree.

To my mind one of the most important questions arising out of this work is, whether the solid substances which are present in the apple juice but are not in the form of sugar, are subsequently converted into sugar, or undergo any fermentation in the process of cider-making. This point seems to me to deserve and need working out. Dr. R. W. Bauer \* has recently succeeded

\* *Landwirths: 'Versuchs-Stationen,'* vol. xliii. p. 191.

in obtaining a variety of sugar by acting on the pectin of apples with dilute acid. It may be that the same change takes place slowly in the acid apple juice, either during the process of fermentation or of ripening.

#### THE MICROSCOPICAL EXAMINATION OF THE APPLES.

If a ripe apple be picked from a tree, the skin carefully washed or scraped into a watch glass, and the liquid examined under the microscope, there will be seen in it a few cells of living vegetable growths, known as "yeast." My friend Mr. J. P. Laws, F.C.S., of Holborn, who has made a special study of the yeasts found on the apple, informs me that he has found no less than five varieties. Dr. Kayser, of Paris, has described \* eleven varieties found in the sediment from cider. Upon the apples I examined, the yeasts were certainly not all alike. What is of more practical value, however, is that little else was present upon the skin of a ripe apple taken direct from the tree. But upon apples which had been allowed to drop and lie on the earth there were many impurities. Of these, some were moulds, and some bacteria.

The pure cider yeast appears to be perfectly round when grown upon nutrient gelatine. But when this pure round variety is placed in some sterile apple juice—that is, apple juice in which other organisms have been destroyed by repeated boiling—it does not grow as a round organism, but is slightly oblong in form.

For the better study and separation of the yeasts some apple juice gelatine was made. This substance, being solid at the ordinary temperature, formed an excellent medium for both the separation and study of the yeasts in a pure form. Again upon this solid nutriment the yeast grew in an oblong form. It would seem evident that the shape of the cells depends upon the food supplied to them.

Very few bacteria were found in the apple juice after it came from the mill. This is probably due to the fact that the juice contains an amount of acid which is detrimental to the growth of air bacteria. It may be remembered that in my work upon cheese, an increase in the acidity of the milk was found to decrease the variety of bacteria present. The lactic acid organism seems capable of growing in cider, though not rapidly, owing to the low temperature at which cider is, and ought to be kept. As is well known, the acetic acid organism is also capable of growing in cider, and is the cause of cider "turning." But so far as can be judged, after so short a time of investigation, by

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\* 'Annales de l'Institut Pasteur,' vol. iv. p. 321.

far the most important consideration is to obtain a juice as free as possible from the wild yeasts and the moulds which are likely to get into the juice unless care be taken to collect and store the fruit in a clean manner.

#### FERMENTATION.

The few experiments conducted this season were made under difficulties. In the first place, I knew of no experiments, previously conducted, which might serve as a guide. The apparatus needed in the cider-making was partly new; and as difficulties arose it was changed; not until the cider-making had been going on for some time did one realise what it would be desirable to record. Then again, owing to the ripeness of the fruit, the season for cider-making was short, and a large amount of work was concentrated into a brief period.

An attempt was made to record the following points on each day of the cider-making: Date of grinding; temperature; variety of apples; day collected; time ripening; weight of apples; time pulp in press; volume of juice; temperature of juice; weight of "pomace" or "must;" number of barrel; observations.

Each barrel as it was filled was numbered, and an analysis of the fermenting juice therein was made at intervals of one week. It was not, however, until some time after the cider-making started that these analyses were commenced, so that my record is not complete. In all, eighty-three analyses were made, and the results are tabulated in the following table in such way as to draw attention to the points which seem to me of most importance.

The first barrel was filled on 28th September—the last on 29th November.

TABLE SHOWING THE AVERAGE COMPOSITION OF FERMENTING JUICE AT DIFFERENT PERIODS.

Time and Rapidity of Fermentation.	Number of Samples.	Solids by Calculation from Gravity.	Acidity.	Alcohol.	Solids by Determination.
Juice when vatted .. ..	6	14·84	·63	..	14·40
After 1 week slow .. ..	7	12·95	·67	2·38	12·53
" 2 weeks .. ..	7	11·45	·67	2·48	11·36
" " rapid .. ..	4	7·53	·67	5·04	8·39
" 3 " slow .. ..	7	9·49	·70	3·48	10·19
" " rapid .. ..	7	5·15	·64	6·00	6·18
" 4 " .. ..	10	4·57	·65	6·30	5·91
" 5 " .. ..	10	3·96	·64	6·66	5·27
" 6 " .. ..	10	3·48	·66	7·05	4·77
" 7 " .. ..	10	2·18	·70	7·95	3·71
" 8 " .. ..	5	1·90	·71	8·16	3·28

One point brought out very strongly by these analyses is that while the saccharometer shows in the apple juice a gravity representing more total solids than are present as determined by analysis, it indicates in the fermented juice less solids than are actually present. This is due to the fact that the alcohol produced is so much lighter than water that it hides the gravity which the solids would otherwise give to the liquid.

#### RAPIDITY OF FERMENTATION.

Attention may first be drawn to the great difference between the rapidity of the fermentation which takes place in the cider first made, and in that which is made later on. Thus, dividing the time of cider-making into about equal parts, the cider made during the first half of the season, *i.e.* before the 14th October, fermented rapidly and contained at the end of three weeks no less than 6.0 per cent. of alcohol; while the cider made after the 14th October fermented slowly and produced in three weeks from the time of making only 3.48 per cent. of alcohol. Similar results were obtained throughout the observations, and it is because all the juice, of which the average composition after four weeks is given, was made before the 14th October, that the percentage of alcohol therein is so high. What is the cause of this rapid fermentation, which it is evident Mr. Harper is justified in calling "wild and tumultuous"? I cannot at present say. Probably one of the main causes was the much higher temperature of the earlier, compared with that of the later weeks. But it is certain that there were other causes at work as well as temperature. Thus it was found that in the filtered juice fermentation was not nearly so rapid as in the unfiltered juice. This is well shown by the following facts. Two barrels were filled with filtered cider on the 23rd October; five weeks after on the 27th November the alcohol in these was 2.78 and 2.74 per cent. respectively. The barrel filled before these on the 16th October, and the one filled after on the 2nd November, both with unfiltered juice, contained at the end of five weeks no less than 6.12 per cent. and 5.33 per cent. of alcohol respectively.

Some experiments have been started by filling three barrels on the same day, one with filtered juice, another with unfiltered juice, and the third with juice partly filtered. The juice which had been filtered fermented far less rapidly than that which was not filtered. This was very evident in several instances. If it be subsequently shown that to obtain a slow fermentation is the best way to ensure a good cider, it is certain that this result will be materially promoted by filtering the juice.

The table showing the composition of the fermenting juice includes all the cider made, and not merely that made in accordance with the rules laid down by Mr. Harper in his paper.

As all the best cider-makers agree in stating that when the juice ferments with rapidity at first, it does not result in such good cider as that which ferments less rapidly, the value of filtration would appear to be considerable.

When all, or nearly all, the sugar has been converted into alcohol, the liquid possesses an insipid and most disagreeable flavour. One would say that it was utterly spoiled for all purposes and for all time: this was specially true of the juice which underwent rapid fermentation. But I am told that in time it recovers itself, and becomes drinkable cider. At the time of writing these notes it is impossible to verify this statement.

The question, however, arises, and seems to me one of the utmost importance: Should the cider ever be allowed to go so far as this? If not, then it is evident that nothing is more detrimental to the making of good cider than a too rapid fermentation.

A few observations were made which show that the weight of must taken from the press is less the longer the apples are allowed to ripen, after being gathered and before grinding. Thus, apples ripened fifteen days left 32·25 per cent. of their weight as must; while apples which had been ripening seventeen days left only 27·27 per cent. It would seem that a larger amount of juice is obtained from apples which have been allowed to ripen thoroughly. This point deserves further investigation.

So far as these observations and experiments go, they all point to the necessity of that careful and cleanly collection and storing of the fruit which Mr. Harper so strongly emphasises in his paper.

It has already been stated that the fermentation of the juice is due to the action of the yeast plant, and that there are several yeasts present in the apple juice.

Now if we wish to produce the finest cider, we shall have to take a lesson from the brewers, and cultivate and use the best cider yeasts as they cultivate and use the best beer yeasts.

Mr. J. P. Laws kindly procured for me from abroad a large quantity of pure cider yeast of the best variety. Experiments were started with this yeast, and so far as I can judge at present the results seem to be highly satisfactory.

Mr. Harper in his paper points out that the best cider from a consumer's point of view should contain about 4 per cent of sugar. Now it is evident that one of two courses is necessary: either



the fermentation must be stopped when it has reached this stage, or it must only just reach this stage at the time when the cider is required for consumption.

As to the best method of stopping the fermentation, no experiments have as yet been made. It opens up the question of how and when cider should be racked. Some makers are in the habit of using a chemical preparation to stop the fermentation, and one such was shown me, which upon analysis was found to be a strong preparation of salicylic acid. This substance is most injurious to health, and I would strongly urge makers not to use it on any account if they wish to maintain the good repute of cider.

Looking at the results of the fermentation from a chemical point of view, we find the loss of solids does not appear to be in direct proportion to the amount of alcohol produced. In some instances, for every 100 parts by weight of solids which disappeared, 51 parts of alcohol were produced. But the average amount of alcohol produced in the 14 barrels up to the end of November was 63 parts for every 100 parts of solids lost. It is evident that this is not a pure alcoholic fermentation, but to determine what takes place will need further study.

Should further investigation prove that the best cider can only be made when the fermentation is slow, then it is evident that, in the future, makers will have—first, to plant late ripening fruit; secondly, to take means to store the fruit in a clean way until the time of year and temperature are suitable for grinding; thirdly, to remove so far as possible all extraneous and injurious ferments by filtration; and fourthly, to start pure fermentation in the juice with selected and pure yeasts.

#### PASTEURISATION.

One word as to Pasteurisation. A temperature of 160° Fahr. is destructive to the yeast ferment. If, therefore, cider when ready for consumption be placed in strong bottles well corked and tied down, and then heated to 160° Fahr., it will keep for any length of time. The best way is to put the bottles in a large boiler, fill this with water and heat gradually. Do not let the temperature rise above 160° Fahr., and immediately it reaches this temperature remove the source of heat. The bottles should remain at this temperature for some time, the best authorities say for two hours, others consider ten minutes sufficient. A simple way is to leave them in the water for two hours, they will then have cooled considerably, and can be taken out and stored away on their sides.

**APPLE PIPS.**

It is generally considered essential amongst cider-makers to crush the pips when grinding the apples, as they are supposed to give a good flavour to the cider, but Mr. Harper states that grinding the apple pips is detrimental to the manufacture and keeping quality of cider. A number of pips were collected and analysed. They were found to contain from 37 to 39 per cent. of moisture (water), and when dried had the following composition :—

**COMPOSITION OF APPLE PIPS (dried at 212° F.).**

Oil .. .. .	18·60
Nitrogenous constituents (albuminoids) .. ..	33·12
Carbo-hydrates, &c. .. .. .	26·08
Woody fibre .. .. .	18·55
Mineral matter .. .. .	3·65
	<hr/>
	100·00

As the brewer finds nitrogenous matters detrimental in brewing, it may be that the pips if ground prove detrimental in cider-making.

**APPLE POMACE.**

As it was thought by some of the farmers that the reed system of pressing would yield more juice than the cloth system, three analyses were made of the apple pomace from each. The average amount of water (juice) left in the pomace was :—

By the reed system .. .. .	72·1 per cent.
By the cloths .. .. .	72·7 „ „

The results are therefore practically identical; but the use of the cloths is certainly cleaner and quicker.

As there has been much discussion of late regarding the feeding value of the pressed apple pomace, I append the average composition of the six samples :—

**COMPOSITION OF PRESSED APPLE POMACE.**

Water .. .. .	72·40
Oil .. .. .	1·08
Nitrogenous constituents .. .. .	1·27
Sugar, &c. .. .. .	18·34
Woody fibre .. .. .	4·64
Mineral matter .. .. .	2·27
	<hr/>
	100·00

I trust that the valuable paper by Mr. Harper, and the results of these few observations, may suffice to awaken sufficient interest in cider-making to insure a continuance of these observations, and of further experiments next season. There is evidently much to be learnt concerning, and vast improvement possible in, the making of cider. That it is worth a little trouble may be judged from the fact, that an increase of 2d. per gallon in the value of the cider produced in Somerset alone would amount to no less a sum than 80,000*l*.

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IX.—*The Town Sewage Question in its Agricultural Aspect.*

By R. SCOTT BURN, C.E., Member of the Institution of Mechanical Engineers.

INTRODUCTORY.

It is now nearly twenty years since I wrote for the pages of this Journal the last, and some thirty since I penned the first, of three somewhat lengthy papers upon a subject which, for the last half century and more, has attracted the earnest attention of all thoughtful minds interested in the progress alike of Agriculture and of Sanitary Science. Other questions have come and gone, have had their brief day of discussion, and then been quietly consigned to that vast limbo, which is ever being filled, but is never full, of once lively but now utterly forgotten subjects. New topics continue to arise from day to day which, from their inherent importance, seem to possess a greater vitality of interest and a happier prospect of practically definite decision; yet somehow, through causes not easy to explain, they also die out from the public mind, and vanish in the multitude of schemes which, although apparently fitted to regenerate a world, are nevertheless wilfully and willingly put beyond the pale of memory.

But, amidst this continuous flow of transient and ephemeral questions, there are some which enjoy what appears to be a perennial vitality. They are being continually discussed, without ever being finally decided upon; so that, although they have their ebbs and flows, or rather their floods and their droughts, they seem destined, like Tennyson's brook, to "go on for ever."

Of such perennial public questions perhaps the most prominent, as it certainly is one of the most important, is that connected with the treatment and disposal of the refuse of our towns and cities.

But while this all-important subject still maintains its special interest; a very remarkable change has come over the character of its discussion. However briefly, particular notice of this must be taken, in order to understand with precision the position in which the general subject is now placed—a position altogether different from that which it occupied at the time I last wrote upon it.

#### PAST ASPECTS OF THE DISCUSSION.

At that period, when the subject was being discussed, two points were almost certain to be specially referred to, and were usually strongly and markedly emphasized. The first of these special points was this: That as a manurial agent applicable to all our farm crops, town sewage represented in the aggregate an enormous amount of actual wealth at the disposal of urban corporate bodies. The second point—a natural or logical sequence to the first—was that our farmers, as a class, were guilty of the greatest financial folly in paying yearly vast sums to foreigners for manurial agents, such as guano, nitrate of soda, and the like, while agents of equal,—or, as some strongly asserted, of greater—manurial value lay, so to say, at their very doors, and, so far as cost was concerned, could be had almost for the asking.

If such positions could have been proved by facts of incontestable accuracy, then, of a verity, we as a people fully deserved all the shower of abuse poured out upon us by a certain class of speakers and writers.

As eminent chemists and men of practical science continued for a long series of years to issue a flood of volumes, pamphlets, papers, letters to editors of newspapers and official reports of the most roseate hue and the most encouraging character—all emphasizing the above points—need it be matter of surprise that the general public were more or less fully impressed with their absolute truth?

But not the least puzzling feature of this question was, that amidst all the vast mass of matter thus placed at their command, the public could obtain nothing which could lead them to form a truly trustworthy estimate as to the nature of this assumed source of corporate and farming wealth and how its respective items were made up.

Under such circumstances, one would have concluded that the shrewd business men who, for the most part, made up the working committees of corporate bodies would not for long have been led astray by such a “will o’ th’ wisp” as all this showed itself to be. But it took years of painful experience—and in

too large a number of instances the bitter lessons of heavy pecuniary losses, arising through costly attempts to gain the gold which was supposed to lie amidst the filthy refuse of their drains and sewers—before corporations had their eyes opened to see the true light. For long they would not, or could not, see that their primary duty to their constituents was simply to remove what was at all times, at least, a nuisance, and occasionally a source of the gravest danger to health. But this, the common-sense aspect of the question, was just the one which was *not* taken by corporate bodies as a rule. They could not make up their minds to relinquish the dazzling hopes which they had cherished for years.

That money *could* be made out of town sewage no one with any pretensions to knowledge upon the subject would have for a moment dared to deny. But how such pecuniary value as was present in it could be got out of it, so that its worth would exceed the cost of getting it, was an altogether different matter.

But this by no means exhausted the difficulties which surrounded the question. It was all very easy to quote the hackneyed phrase that the “waste of the towns was the wealth of the country,” but this took no account of the work to be done between the point where the “waste” was created, and the country in which it was to be converted into “wealth.” And yet within the limits between those two points lay a wide range of most difficult questions, some of which it was not easy to answer, and to more than one of which even our most able “experts” would have found it impossible to say whether the answer was to be yes or no.

Some conception of the difficulties which the new problem presented to our predecessors may be gathered from my papers in Vol. XI., New Series (1863), and in Vol. VI., Third Series (1874), of this Journal, which should at least be glanced over by those interested in this truly important agricultural question, as all the practical points of the subject are there detailed. In the present paper, which the writer, at his advanced years, but reasonably concludes will be the last on the subject that he is likely to prepare, I propose to consider, as far as the exceedingly limited space at disposal permits, the position which the great Town Sewage question now occupies among the corporate bodies of our large towns and cities, who are the most directly interested in its true solution.

And, in this connection, I may perhaps be permitted to allude to the fact that the views maintained in the papers named above, unpopular as they were deemed at that time to be—antagonistic as they were to the golden or rose-coloured ones almost universally taken of town sewage as a source of wealth:

—have been amply corroborated by fact after fact, and by the experience gained by the failure of one system after another.

Under the now stringent legislation with regard to streams and rivers, what is the position of many corporate bodies in relation to this great question of town sewage, which has kept communities in a condition of chronic consultation for many years in times past?

#### THE LIVERPOOL METHOD.

If the chance visitor to “lordly Liverpool” should find his way across the Mersey, and make a pleasant sojourn for a few days in one of the hotels of New Brighton which face the sea, the moving panorama always sweeping past, up and down the noble river, will draw him with ever-increasing delight to gaze upon it, and to endeavour if possible to take in all its elements. In his attempts to analyse this truly wondrous scene, he cannot fail before long to have his attention directed to an ugly-looking fleet of screw steamers, which keep regularly plying up and down the river. Upon inquiry the observant stranger will probably be informed that these vessels are known by the not very euphonious or pleasantly suggestive name of the “Dirt Boats” or “Fleet,” and that they are the property of the great and wealthy corporation of Liverpool. They have at great cost been installed for the purpose of conveying the semi-liquid sewage matter of their important city to deep-sea points, where by “dumping,” or letting loose, their altogether unsavoury cargoes into the deep-sea channel, they at once and finally lose sight of and, so far as the corporation is concerned, *get finally and thoroughly rid of it*. That the example thus set is contagious, and is likely to be followed by other corporations who have access to the all-absorbing sea, is evidenced by the fact that the corporation of Salford (Manchester) is about to send its liquid sewage to the sea at Liverpool *via* the Manchester Ship Canal; while the London County Council has already a fleet of “dirt boats” carrying the sewage from the great sewage outfall at Crossness to a deep-sea outfall some fifty miles distance: and this after costly endeavours to utilise it! The cost per ton of transporting the sewage of London is  $5\frac{1}{2}d.$ , and that of Salford has been estimated at  $7\frac{1}{2}d.$ , and this for simply getting rid of it.

But what of the towns which have the misfortune—under this view of the case—to have no direct or ready access to the sea, and yet are absolutely prohibited from defiling any river with the sewage sludge? This brings me to consider other systems, of which I select, as a typical example, the “precipitating and sludge

pressing system," by which the effluent water of the sewage is passed into the river in a state of sufficient purity to satisfy the river authorities—as carried out at Buxton in Derbyshire.

#### THE PRECIPITATION SYSTEM.

The chief features of the system adopted here are, first, the treatment of the liquid sewage with a chemical solution, with which it is briskly agitated or mixed in what may be termed the mixing tank or reservoir; second, the passing of the mixed sewage into precipitating tanks, in this case 260 feet long by 75 feet broad, made of brick with a concrete bottom of Portland cement. These tanks are in duplicate, so that when one is being emptied of its deposited sludge and cleaned out, the other is in full operation with its load of sewage. The third feature of the system is the treatment of the supernatant liquid or effluent water, which, as it is formed through the gentle and gradual deposition of the solid constituents of the sewage in the tanks, flows quietly away, and in such a manner as to subject it in the most complete way to the action of the air. This aeration, or oxidising, of the flowing-off liquid—and a most important point, I take it to be, in the process of purification—is secured by first passing the liquid over an effluent brick-made "sill," 75 feet wide, and thence down the successive falls of a surface-stepped weir, constituting a series of miniature waterfalls, the agitating effect of which on the water in promoting aeration or oxidation is very prompt and decided. From this, the liquid passes along a conduit in a very thin stream, the aerating effect of which is prolonged by making the conduit take a circuitous or serpentine route, and from this the liquid is finally passed into the river Wye.

A chalybeate water (obtained from a disused mine three miles distant from the works, to which it is brought by a line of 9-inch stoneware pipes), containing, in round numbers, some fifty grains of crystallised sulphate of iron to the gallon, is mixed with milk of lime in the proportion of 60 grains of lime to the gallon of the chalybeate water. This is then added to, and thoroughly mixed with, the liquid sewage in the mixing tank within the building, in the proportion of one part of chemical solution to five or six parts of the liquid sewage.

As soon as one of the two tanks has completed its depositing process, the sewage is passed into the duplicate tank, which has been cleaned out ready for another service. The semi-liquid sludge is then pumped from the precipitating tank into a storage tank within the building, capable of holding about 10,000 gallons. From this, it is passed into two of Johnson's

ir-compressor filters, which squeeze out about 75 per cent. of the water. This runs into the large precipitating tank, leaving the sludge in the form of a black cake, containing a fairly large proportion of the fertilising constituents of the sewage. As yet there has been no revenue from the sale of the sewage cake as a manure. The "power" necessary to mix the sewage and press the sludge is obtained from a small water-wheel some sixteen feet in diameter, three feet wide on the breast, water to work which is readily obtained.

#### PAST AND PRESENT METHODS.

Town refuse, as a whole, is divided into two great classes of substances or materials: first, the liquid or sewage proper; second, the solid or domestic and industrial or trade refuse, of "all sort and conditions of things, fair and foul, but chiefly foul," making up a heterogeneous mass, which men, as a rule, desire to put out of sight—and sometimes smell—with all convenient speed. But largely composed, as the mass is, of organic decaying matter, it is, after a fashion, a manurial substance of greater or less fertilising value, and was, and is, used by many farmers in the vicinity of large towns.

But a change has apparently "come over the spirit of the dream" of, at least, some corporate bodies; and now, as with the case of the "deep-sea" depositing of the liquid sewage in some towns, their desire with regard to the solid refuse is *simply to get rid of it*. Take the city of Edinburgh, as an example. Thanks to the "monks of old," who centuries ago established the sewage-irrigated meadows in the vicinity of the city, Edinburgh has a means of utilising its liquid sewage, or a large portion of it. Quite recently the corporation have shown, in a very practical way, their opinion of the value of their *solid town refuse*, by erecting at great cost what are now,—after the fashion, or in the spirit rather, of the new change which has come over the minds of corporate officials in relation to their town refuse,—termed "Destructors," or special furnaces in which what is combustible is simply burnt up. In large towns, such, for example, as Salford, already referred to, elaborate schemes for burning up the solid refuse are proposed, combined with which are several useful purposes, such as the ventilation of the sewers, &c. All this, while it adds to the efficacy of the destructive system, makes it more expensive, so much so that it cannot be said to be a cheap system.

Such then is the condition in which we now find the town sewage question as represented in a large number of corporation



works throughout the kingdom, and, as the reader will at once perceive, the leading characteristic is a very simple one, namely, to get rid of the liquid sewage and the solid refuse matter as quickly and as cheaply as possible. No matter *how*, so that it is got rid of.

If the predecessors of those who are now "clothed with a little brief authority" in corporate bodies were permitted for a brief space to revisit the scenes of their former labours, they would scarcely believe the evidence of their own eyes and ears in regard to the astounding change which has come over corporate minds in relation to the town sewage question. And yet, after all, however much we may be inclined to censure the corporations of a generation or so ago for their grave mistake in overlooking their one duty—the sanitary—and being led astray from this by the hopes, so often shown to be utterly delusive, of making a revenue out of that from which it was their duty simply and solely to relieve their constituents, it must be confessed that there was something more in keeping with the claims of science in their system than in that of some of their successors now in office. The endeavour to make the most and the best of the sewage under their charge was, at any rate, better than the childlike method of simply destroying it or throwing it away out of sight and smell. The old system had, at least, the merit of appearing to be common-sense, if not scientific, in its spirit; the new is simply what a savage might be supposed to do if asked to deal with the difficulty. This is certainly strong language. But what else can be used if we look at the question from either a scientific or practical point of view?

Take, for example, the system of simply getting rid of the solid refuse by consuming it in those destructors, about which, strange to say, even some men of science have been singing pæans of praise, as if the capability simply to destroy were a grand discovery. Now this solid refuse of our populous places has—apart altogether from such fertilising constituents as it contains—a *value peculiarly its own as a manurial agent*. The refuse, when mixed with the soil, serves to open up the pores of the latter, exposing to atmospheric influences more of it than otherwise would be exposed. Every thorough farmer knows the high value, as ameliorating agencies on the soil, of atmospheric influences. This is especially true in the case of the heavier and more retentive soils in which some solid substances, even if of no great manurial value, may be beneficial in their mechanical effects.

## SEWAGE FARMING.

It has always appeared to me—and I have shared the belief common with not a few eminent men who were sound and successful practical farmers—that the weak point of *pure sewage* or farming purposes was its wholly liquid, or, in its best form, *emi-liquid*, character. In this condition it lacked the solid element which we have seen to be of high value in such manurial substances as farmyard manure or stable-dung. And it is worthy of note that at the period from which my brief backward look dates, the value of solid manurial substances when used in conjunction with the liquid sewage on sewage farms was rapidly being realised. One highly favourable result of this movement would have been the practical influence exerted upon the future of the town sewage question had the principle been extensively applied in sewage farming practice on certain soils. And in this connection it is specially worthy of note that one of the reasons why, in the purely sandy soils, liquid or semi-liquid town sewage displays its powers so strikingly and beneficially in thoroughly changing the character of the open sandy soil, is that the more solid particles of the sewage are arrested by, and, more or less, retained between, the interstices of the sandy soil, thus forming in process of time what might be termed a fairly good loamy soil, capable of growing crops which, in its original condition, the soil could bear but poorly, if at all. Hence the value in ordinary irrigation practice, where pure water is alone used, of making the water the vehicle—and an admirably mobile and diffusive one it is—for carrying and depositing manurial substances of a more or less solid character. Some practical notes on this important subject, which I venture to think will yet come to the front, will be found in my earlier papers already referred to.

This opens up the interesting agricultural question—could not the solid refuse of towns be so treated in some simple inexpensive way as to make it not only more acceptable than at present in its crude condition—filled with substances utterly useless as manurial agents—but so as to give it a manurial value, for which the farmers would willingly pay something commensurate with its increased worth? There is no doubt that solid town refuse can be so treated, and at a moderate cost, moreover; while it is worthy of note that some of the substances thus taken from it would possess a special, and a comparatively high, value, which would go far to pay the cost of treatment.

Destruction, pure and simple, is essentially antagonistic to those principles of applied science which of late years have

brought about such striking and beneficial results in almost every branch of national industry, and which are yet destined to work even greater wonders in the not very remote future. To these considerations it is well that corporations having town refuse of both classes, solid and liquid, to deal with, should take due heed before they are committed to a course of action which—however they may by changing circumstances be inclined to discontinue—they find they cannot abandon.

#### SEWAGE SLUDGE AND HOW TO DEAL WITH IT.

One word as to the sewage sludge or pressed cake system which some corporate bodies may yet consider that they are simply compelled to adopt. As there seems—from testimony from widely separated districts—to be no demand whatever for this cake for farming purposes, some method of disposing of it has to be found. The latest proposal is to use it in the *destructors* as fuel for steam-raising purposes only; but it may be well to consider whether a more profitable, and assuredly a more scientific, mode of dealing with it could not be devised. It might, for example, be worth the while of some rich Corporation to try whether in a perfectly dried condition it could not be ground up to a powder to be used as a basis for the manufacture of an artificial manure, which would be all the richer from the fact that the basis itself would, and does, possess a certain manurial value. But if we look further afield we may perhaps derive a practical hint from some branch of industry very remote from that of town sewage treatment. Judging from the constituents of sewage, it is just possible—from a scientific point of view it may be held that it is highly probable—that, if heated in a certain form of furnace provided with appropriate appliances, certain valuable bye-products might be obtained, while at the same time there would be still a large surplus of highly-heated air available for steam raising and sludge cake drying processes. There is reason to believe that some men of science are giving their attention to this method of utilising the sludge sewage cake. One cannot but wish them all success, for it will be a result much more in consonance with the scientific ideas of the times we live in, and more satisfactory to the economic mind, than a process of pure destruction only.

#### HAVE WE REACHED FINALITY.

Having endeavoured, under all the difficulties of restricted space, to give the reader an account of the position to which the town sewage question, so long a vexed one, has now attained,

we have a point forced upon our attention, and to which it is essential, for the purposes of the present paper, that some consideration, if only of the very briefest, should be given. And the point is this: Is the present position to be the final one, the *ultima Thule*, beyond which no explorer will dare or be permitted to go? We are all apt to run into extremes. Action and reaction are in mental as in material philosophy equal, and it is just possible that the recoil from the old system, in which all that glittered was taken to be gold, has driven the public, or rather the corporate mind, completely in the opposite direction, where nothing is seen to glitter, and no gold is to be found.

The value town sewage possessed under the old *régime*, still remains under the new; and that it did and does possess a certain value for farming purposes, not even the most enthusiastic advocate and admirer of the purely destructive system can have the hardihood to deny. There is but little likelihood now, one would think, that corporations will be led to indulge in wild-goose chases in the expectation of realising what, from the very nature of things, could not be realised to anything like the extent anticipated by many. But this is vastly different from rushing to the opposite extreme, and declaring that there is no value in town sewage, and that the only true way of dealing with it at all is to put it out of our ken altogether by simply destroying it. It is scarcely conceivable that we, who pride ourselves upon being a thoroughly out-and-out practical people, and who further have the highest possible reason to be proud of the fact that we are also a scientific people, ready and eager through the aid of science to improve every industry and wrest from it all the wealth which it is capable of producing, shall rest satisfied merely with a policy of destruction, a system of waste pure and simple. And if ultimate destruction, or hiding the sewage away in the depths of the sea, is to be the "be all and end all" of the system of future disposal, it will surely be more in consonance with the practical utilitarian spirit of the times we live in, at the very least, to try, before the sewage reaches the final stage of destruction or disappearance, to get *at least a part* of the value which lies locked up within it, and this while in no way interfering with sanitary necessities. It seems to my mind to be little less than a libel—a grave charge of almost gross incompetency—to say that modern applied science could not help to bring about such a desirable result. Knowing somewhat of the splendid services of science in the past, knowing in what direction she is still working for the future, I am by no means disposed to believe that she will thus retire or be forced from this field of research defeated and disgraced. Many and grave

will be the signs of decrepitude and decay which science must display before it can possibly come to this discreditable point in its history. The writer is pleased to think that he is not alone in holding fast a full faith in the power and the capabilities of science for the grand work she has yet to do, even in this, at present, most unpromising, if not discouraging, field of inquiry.

#### FUTURE POSSIBILITIES.

Amidst so much that is of a negative character in connection with this great question, one thing of a positively promising nature appears to be fairly well established. It is, that those who, through a long course of years, alike through evil and through good report, advocated a wider extension of systems of irrigation in localities and lands suited thereto, will have their position greatly strengthened. For, apart from all other considerations, farming or otherwise, soil is at once the quickest and most effective deodoriser and purifier of foul waters, while water, as a vehicle by which manurial matter can be conveyed to any part required, has no rival. Those who wish to see what irrigation, pure and simple, can do in changing vast tracts of the most sterile sand,—over which, not so long ago, the wild winds swept fiercely, driving it into long stretches of billowy ridges,—into tracts of fertile land, green with the richest of verdure, or bearing waving crops of golden grain, must cross the Channel and visit some of what were, not so many years ago, the wildest parts of the Continent. Irrigation has yet a great field in the reclamation of land now poor and sterile. And in this, town refuse may yet play a far more important—because a more wisely arranged—part, than it has hitherto done, when the adverse circumstances which have hitherto encumbered it have, under more prudent, because more scientific and practical systems, been swept aside.

Apart from such fertilising value as sewage, beyond all doubt or cavil, assuredly possesses, the power of soil, in changing the foulness of the town products into the pellucid streams which enrich and beautify the fair fields of our country, must not be overlooked. Several striking examples of this are to be met with, as at the sewage farm of Beddington near Croydon, and in various other parts of the kingdom.

#### THE COURSE TO FOLLOW.

In this great question, as in many others, it will in all probability be found that the middle course between the two extremes is the best and safest to follow. The writer of these

lines has, happily at least for himself, not yet outlived the belief of his earlier days in the power of science, aided by the gifts of practice, to do great things in the way of making the best and the most of those gifts which our beneficent Creator has scattered with such loving and lavish hand on all sides around us. Science, he prefers to believe, has not yet lost her "grip" of what lies concealed or shut up within the foul refuse of our towns. As she has wrested sweet odours from substances not a whit less unsightly and mal-odorous than town sewage, so will she yet lay her hands upon what *it* contains of good, and lay it before the people for their acceptance and satisfaction. Time, that "great innovator," will show whether this will be so or not, and to Time, with its all-healing and beneficent influences, we leave this question with all its outcomes and possibilities. That these will resolutely work wholly in favour of farming we prefer to believe rather than the gloomy contrary. Thorough pessimism closes all avenues to hopeful endeavour, just as wise and judicious optimism keeps them at least open. The reader can decide for himself which of the two is the wisest policy and most likely to lead to practically useful results.

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X.—*Field Experiments* in 1893. By CYPRIAN R. KNOLLYS,  
Steward of Experiments.

THE Experimental work of the Society in the year 1893 has been devoted to the improvement of permanent pastures, and it would probably be difficult to conceive a season more unfavourable than that of the past year, for the successful conduct of Field Experiments of this class.

Readers of the last issue of the Society's 'Journal' will remember that in 1892 a scheme of experiments on a small scale was set on foot with the object of ascertaining "what artificial manures can be used with advantage in improving the herbage of old pasture," and with the ulterior object of ascertaining whether some scheme, on rather a larger scale, which would be both accurate and practical in its results, could not be arrived at.

The scheme consisted of five plots (unfenced, but their boundaries marked by pegs driven into the ground) of half an acre each, of which the central plot, E, was left unmanured, and the remainder (under the advice of Dr. Voelcker) were treated as follows:—

- A. 3 cwt. Bone Meal per acre.
- B. 10 cwt. Basic Slag per acre.
- C. 3 cwt. Dissolved Bones per acre.
- D. 2 tons Lime per acre.

The plots were carefully inspected and reported upon periodically, and though at some of the experimental stations no appreciable difference between the plots could be observed, there was, on the whole, sufficient evidence to show that Basic Slag had been most successful, producing an herbage which the stock grazed very much closer than that on the other plots.

The inspection of these plots was continued in 1893, with the result that, on a variety of soils, the Plot B (dressed with Basic Slag) fully maintained its superiority over the others, amongst which the action of the Bone meal seems perhaps the most marked.

The following statement gives the names of the gentlemen who have conducted these experiments, the districts to which they belong, and a short summary of the results at each station.

SIR T. D. ACLAND	} <i>Holnicote, near Minehead, Somerset.</i>
MR. C. BIRMINGHAM	

These plots form part of a poor pasture situated at a considerable height above the sea level. Plot B is here markedly superior to the other plots, being full of clovers, and continually grazed in preference to the rest of the field by stock of all kinds. Plots A and C (Bone meal and dissolved Bones) have considerably improved. The lime Plot D was very much burnt, but now appears to be recovering.

MR. J. D. ARMSTRONG, *Vallis Farm, Frome.*

This pasture is naturally of rather good quality, and not much difference between the plots is discernible. Both in 1892 and 1893 Plot B (Basic Slag) has been slightly the best, but latterly stock have been showing some preference for Plot A (Bone meal), in which there are now rather more clovers than in C and D.

MR. E. TYLEY, *Cheddar, Somerset.*

The plots here form part of a pasture which is naturally rather inclined to be wet. No difference between the plots could be observed in 1892, but in 1893 the Basic Slag and the Bone manures appear to have brought up the clovers and generally improved the character of the pasture; Plot B (Basic Slag) being the most closely fed down.

MR. GEORGE GIBBONS, *Tunley, near Bath.*

The results here differ from those at any of the other stations. In 1892, the lime plot D was distinctly the best, but an inspection, in the autumn of 1893, showed that the plots treated with Bone meal and dissolved Bone (A and C) were, to a slight extent, the best, the Basic Slag having apparently no effect whatever.

MR. GEORGE GIBBONS, *Clutton, Somerset.*

Here, too, the lime plot was superior in 1892, and the action of the Basic Slag was not then observable, but in 1893 there was no difference in any of the plots, except that treated with Basic Slag, which was decidedly more full of clovers, better grazed, and of a darker colour.

It is remarkable that both here and at Tunley the lime should have had such marked effect in the first year and not in the second. The soil at the Tunley station being a stiff loam on lias, and at Clutton a strong red clay, inclined to wet.

MR. M. COURT, *Long Ashton, near Clifton, Bristol.*

The effect of the manures on these plots is not appreciable.

MR. H. P. JONES }  
MR. H. FRY } *Stalls Farm, near Warminster, Wilts.*

In 1892 there was very little to be observed on these plots, but after the spring growth in 1893 the difference between them was clearly marked. Plot B produced the best bed of grass with a large quantity of clovers, while Plot A (Bone meal) comes second, both these plots being greatly preferred by stock to the other two, C and D, which do not show any appreciable result of the dressings applied to them.

SIR GABRIEL GOLDNEY }  
MR. H. B. NAPIER } *Bradenstoke, near Chippenham, Wilts.*

Both in 1892 and 1893, Plot B has perhaps been slightly the best, but the difference is not great.

MR. E. MOORE, *Hardenhuish, near Chippenham.*

In 1892, and in the earlier part of 1893, the Basic Slag plot was certainly the favourite, but when this station was visited in the autumn, Plots A, B, and C appeared about equal.

MR. H. PHELPS, *Boro' Green, Kent.*

These plots are situated in a pasture, which was reclaimed from woodland, and laid down about twenty years ago. The



land does not seem to take kindly to grass, even when liberally treated. Basic Slag (Plot B) takes a decided lead here over the others, both in improving the herbage and making it more palatable to the stock.

MR. W. ASHCROFT, *Layhams, near Hayes, Kent.*

In 1892, and the early part of 1893, the Basic Slag plot showed to advantage here, both in the growth of clover and in the partiality for the herbage shown by stock. During the autumn, however, it appears to have rather lost ground, and the lime Plot D to have improved.

Mr. Ashcroft expects a more marked improvement in Plot D next year.

This scheme was followed up in 1893 by another set of experiments with the object of "ascertaining the effect of certain dressings upon coarse or sour pastures."

The following is a reprint of the conditions under which these experiments are being conducted :—

*The Experiments are to be tried upon a pasture, the feeding quality of which, owing to coarseness or sourness, is deficient. The pasture should be grazed (not mown) for the next three years, and care should be taken not to select a field the feeding quality of which is deficient from want of draining or other known cause.*

*The Plots, six in number, are to be half-an-acre in size, and, under the advice of Dr. Voelcker, are to be treated as follows :—*

- a. 5 cwt. Salt per acre.
- b. 6 cwt. Kainit per acre.
- c. 2 tons Lime per acre.
- d. 2 tons Lime and 6 cwt. Kainit per acre.
- e. 10 cwt. Basic Slag per acre.
- f. To be left untreated.

*The lime should be that ordinarily used in the district for agricultural purposes, and is to be obtained by the Experimenter and charged to the Society. The artificial manures will be paid for by the Society and forwarded to the nearest Railway Station.*

*All the manures should be applied as soon as possible.*

*Wooden pegs should be driven in at the centre and corners of each plot.*

At four of the experimental stations, on different varieties of soil, two plots of half-an-acre each were added, and to these were applied renovating mixtures of seeds, with a view of ascertaining whether any improvement could be made in the pasture in this way. These renovating mixtures, which were very kindly supplied gratuitously by Mr. Martin J. Sutton, varied in accordance with the character of the soil. These plots were then divided, and a different mixture, A and B applied to each quarter acre, the price of the A mixture ranging from 12s. to 15s. per acre, and the B mixture from 9s. 6d. to 12s. During the latter part of May these two plots were dressed with 1 cwt. of nitrate of soda per acre.

The following statement gives the names of the gentlemen who are kindly conducting these experiments :—

Sir T. D. Acland	} Trerice, Newlyn East, Cornwall.
Mr. W. H. Tremaine	
Sir T. D. Acland	} Holnicote, near Minehead.
* Mr. C. Birmingham	
Mr. A. Blake, Her Majesty The Queen's Farm, Osborne, Isle of Wight.	
Sir T. D. Acland	} Killerton, near Exeter.
* Mr. W. Stevens	
* Mr. A. C. Skinner, Bishops Lydeard, Somerset.	
Mr. Sellick, Brompton Ralph, near Wiveliscombe, Somerset.	
Mr. George Gibbons, Tunley, near Bath.	
Mr. T. D. Till, Thornbury, Gloucestershire.	
* Mr. Hewett, Leckford, Stockbridge, Hants.	
Mr. F. D. Brockman	} Beachborough, near Hythe, Kent.
Mr. Lipscomb	

The extraordinary season of 1893 renders any results at present obtained from these experiments not sufficiently definite to be put into print, and it is therefore proposed to defer any detailed statement of them until the effects of another season have been noted. It may, however, be added that, in these experiments also, Basic Slag is holding its own, though at present not perhaps to the same extent as in the 1892 scheme.

With regard to the renovating mixtures of seeds, the prolonged drought appears to have prevented their germination.

The Committee desire to tender their warm thanks to those gentlemen who are kindly conducting these experiments, and to express the hope that the valuable assistance they are good enough to give will not be so severely handicapped next year by such an untoward season as that of 1893.

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\* Additional Plots for renovating mixtures.

XI.—*The Society's Dairy Schools.* By THOS. F. PLOWMAN,  
Secretary and Editor.

DURING the past year the Society has continued its efforts to promote practical education in dairying through the medium of its Schools, and its activity in this direction has been stimulated by the calls which have been made upon it by public bodies.

The nature of the instruction, the methods of procedure, and the appliances used at the Society's Schools, have been fully dealt with in previous issues of the Society's Journal, and have since been reprinted in pamphlet form, so that it is only necessary now to add to the statistics of former years some particulars with reference to the immediate past.

Since the establishment of its Schools in 1888, and up to the end of 1893, the Society had expended the sum of 12,587*l.* 13*s.* 5*d.* in the promotion of Technical Instruction in Dairying. This, however, does not by any means represent the total amount devoted to this object, through the instrumentality of the Society, as it does not include such expenses as the hiring and fitting up of buildings for the travelling Butter Schools, and other local liabilities undertaken by the District Committees co-operating with the Society; nor the cost (defrayed by the Society) of the Working Dairy at its annual exhibition and of the students' competitions therein.

With a view to the encouragement of students, special prizes for cheese and butter, made by students who have attended any of the Society's Schools, are offered at the Society's annual exhibition, which opens on May 30th next at Guildford. At this exhibition there will also be butter-making competitions in the Working Dairy for students who have passed through the Society's Schools.

#### BUTTER SCHOOLS.

At the request of County Councils, the Society during 1893 conducted travelling Butter Schools for the counties of Somerset, Kent, Dorset and Devon.

The Society has carried on these Schools without any charge to the County Councils beyond that for actual out-of-pocket expenses.

The instruction has been given by six teachers, viz.: the Misses A. Angus, A. Barrett, A. A. Benjafield, M. Benjafield, M. Smart and A. Williams; and, in addition to this, practical addresses have been delivered to each class of students by the Society's Dairy Steward (Mr. G. Gibbons). The latter

personally supervises both the Butter and Cheese Schools, and the Society's Secretary are responsible to the Agricultural Education Committee for the organising, financial and clerical work connected with the Schools.

During the present year (1894) the Society is conducting schools for the County Councils of Somerset and Devon.

The accompanying tabular Statement shows the number of students at each centre visited by the Butter Schools up to December 31st, 1893.

### BUTTER SCHOOLS

conducted by the SOCIETY from October 15th, 1888, to December 31st, 1893.

County.	Centre.	No. of days School was open.	Year.	No. of Students.		
				10 days.	Shorter periods.	Total.
Dorsetshire	Builth .. ..	7	1890	..	14	14
Devonshire	Exeter .. ..	21	1889	22	3	25
"	Barnstaple .. ..	11	1893	4	1	5
"	Bideford .. ..	11	"	8	2	10
"	Colyton .. ..	11	"	12	..	12
"	Exeter .. ..	11	"	5	5	10
"	Hatherleigh .. ..	21	"	16	2	18
"	Merton .. ..	11	"	18	1	14
"	South Molton .. ..	11	"	8	8	16
"	Tiverton .. ..	21	"	22	3	25
"	Torrington .. ..	21	"	18	1	19
Somersetshire	Bridport .. ..	21	1890	26	..	26
"	Fontmell Magna .. ..	11	1891	12	..	12
"	Portesham .. ..	21	1892	24	..	24
"	Maiden Newton .. ..	21	"	23	..	23
"	Bridport .. ..	11	"	11	1	12
"	Charmouth .. ..	21	"	16	..	16
"	Buckland Newton .. ..	21	"	14	..	14
"	Sherborne .. ..	11	1893	11	..	11
"	Leigh .. ..	11	"	11	9	20
"	Lydlinch .. ..	11	"	12	1	13
"	Alveston .. ..	11	"	12	..	12
"	Stower Provost .. ..	11	"	12	4	16
"	Gillingham .. ..	21	"	19	1	20
"	Blandford St. Mary .. ..	11	"	4	22	26
"	West Stafford .. ..	11	"	7	4	11
"	Upwey .. ..	11	"	8	5	13
"	Winfrith .. ..	11	"	11	3	14
"	Corfe Castle .. ..	11	"	10	2	12
"	Wareham .. ..	21	"	23	3	26
"	Holt .. ..	21	"	21	3	24
"	Horton .. ..	11	"	9	1	10
Carried forward ..		468	..	424	99	523

## BUTTER SCHOOLS—continued.

County.	Centre.	No. of days School was open.	Year.	No. of Students.		
				10 days.	Shorter periods.	Total.
	Brought forward ..	468	..	424	99	523
Gloucestershire ..	Berkeley .. ..	11	1889	9	..	9
" ..	Gloucester .. ..	21	"	20	6	26
Herefordshire ..	Bromyard .. ..	11	1891	10	..	10
" ..	Kington .. ..	11	"	4	15	19
" ..	Hereford .. ..	21	"	21	5	26
" ..	Ledbury .. ..	11	"	12	4	16
" ..	Leominster .. ..	11	"	8	4	12
" ..	Ross .. ..	11	"	9	1	10
Kent .. ..	Tonbridge .. ..	21	1892	12	11	23
" ..	Westerham .. ..	11	"	11	3	14
" ..	Igham or Wrotham ..	11	"	6	7	13
" ..	Maidstone .. ..	10	"	1	7	8
" ..	Cranbrook .. ..	11	"	10	12	22
" ..	Tenterden .. ..	11	"	10	2	12
" ..	Ashford .. ..	31	"	20	5	25
" ..	Hythe .. ..	21	"	17	6	23
" ..	Dover .. ..	11	"	4	4	8
" ..	Sandwich .. ..	11	"	8	1	9
" ..	Swanley .. ..	31	"	32	..	32
" ..	Canterbury .. ..	31	1893	19	..	19
" ..	Gravesend .. ..	11	"	7	3	10
" ..	West Wickham .. ..	21	"	18	4	22
Middlesex .. ..	Hampstead .. ..	21	1889	24	..	24
Oxfordshire .. ..	Oxford .. ..	21	"	20	5	25
Pembrokeshire ..	Pembroke .. ..	31	1890	45	..	45
Radnorshire ..	Llwyn Madoc .. ..	7	"	..	7	7
" ..	Newbridge-on-Wye ..	7	"	..	7	7
" ..	Rhayader .. ..	21	"	20	2	22
Somersetshire ..	Shepton Mallet .. ..	31	1888	32	2	34
" ..	Clevedon .. ..	21	1889	27	9	36
" ..	Yeovil .. ..	21	1891	21	2	23
" ..	Crewkerne .. ..	21	"	17	4	21
" ..	Langport .. ..	21	"	19	11	30
" ..	Williton .. ..	11	"	6	6	12
" ..	Minehead .. ..	11	"	12	6	18
" ..	Chard .. ..	21	"	12	..	12
" ..	Taunton .. ..	31	"	26	2	28
" ..	Weston-super-Mare ..	21	"	20	6	26
" ..	Axbridge .. ..	21	"	11	6	17
" ..	Glastonbury .. ..	21	1892	16	2	18
" ..	Highbridge .. ..	21	"	16	1	17
" ..	Midsomer Norton ..	21	"	19	..	19
" ..	East Harptree .. ..	21	"	17	4	21
" ..	Bath .. ..	31	"	34	8	42
" ..	Wells .. ..	21	"	20	6	26
" ..	Nailsea .. ..	31	"	29	..	29
" ..	Keynsham .. ..	21	"	21	5	26
" ..	Somerton .. ..	21	"	21	1	22
" ..	Wincanton .. ..	21	1893	21	..	21
" ..	Dulverton .. ..	21	"	21	6	27
	Carried forward ..	1109	..	1289	307	1546

BUTTER SCHOOLS—continued.

County.	Centre.	No. of days School was open.	Year.	No. of Students.		
				10 days.	Shorter periods.	Total.
Somersetshire	Brought forward ..	1409	..	1239	307	1546
	Wiveliscombe ..	21	..	15	5	20
	Milverton ..	11	..	11	1	12
	Wellington ..	11	..	8	4	12
	Cannington ..	11	..	10	..	10
	Martock ..	21	..	14	1	15
	Dunkerton ..	11	..	7	..	7
	Batheaston ..	11	..	8	1	9
	Cannington ..	11	..	7	1	8
	Clutton ..	11	..	8	..	8
	Frome ..	11	..	3	4	7
	Bruton ..	21	..	17	1	18
	Queen Camel ..	11	..	8	..	8
	Oxford ..	21	1891	22	..	22
	Lingfield ..	11	..	13	..	13
Surrey	Horley ..	11	..	12	..	12
	Chobham ..	11	..	12	2	14
	Leatherhead ..	11	1892	4	..	4
	Dorking ..	11	..	6	3	9
	Guildford ..	21	..	9	8	17
Sussex	Wiston Park, Steyning	7	1890	..	15	15
Warwickshire	Coventry ..	21	1889	22	7	29
Wiltshire	Swindon ..	21	1888	21	11	32
..	Chippenham ..	31	1889	36	8	44
Worcestershire	Worcester ..	21	1890	24	6	30
		1769	..	1536	385	1921

CHEESE SCHOOLS.

The teaching, apart from the experimental, section of the 1893 Cheese School, was carried on by the Society on behalf of the Somerset County Council.

The School was held at Rock's Lower Farm, Butleigh, near Glastonbury, the occupier of which (Mr. H. G. Bethell) rents under R. Neville-Grenville, Esq. The usual arrangements were made with the tenant for the use and control of his dairy, the supply of milk from his cows, and the boarding and lodging of students in his house. The School was opened on April 1st, and closed on October 31st.

As in previous years, the Society had the advantage of the services of Mr. H. Cannon, of Milton Clevedon, to supervise the School, and of his eldest daughter as teacher. The daily supply of milk was checked, and other assistance rendered, by a bailiff.

For purposes of comparison, the amount of cheese made at the Society's four Schools, and the prices realised, are given in the following table. Messrs. Hill Bros., of Evercreech, were the buyers, and the quantity sold included the entire output.

## AMOUNT of CHEESE MADE and PRICES REALISED.

Date.	Place.	Number of Draft.	Weight.	Total weight.	Price per 112 lbs.	Average price per 112 lbs.	Milk used.
			cwt. qrs. lbs.	cwt. qrs. lbs.	s. d.	s. d.	gals.
1890	Wells	First (May 1 to 31) .. ..	37 1 12	198 1 7	61 6	65 6	23.24
"	"	Second (June 1 to July 20)	35 2 2		66 6		
"	"	Third (July 21 to Aug. 31)	21 2 19		66 6		
"	"	Fourth (Sept. 1 to Oct. 31)	103 3 2		67 6		
1891	Frome	First (Apr. 1 to May 11) ..	26 2 17	176 1 13	54 0	60 3	20.78
"	"	Second (May 12 to June 11)	33 1 17		65 0		
"	"	Third (June 12 to Aug. 11)	57 1 24		66 0		
"	"	Fourth (Aug. 12 to Oct. 31)	57 0 0		66 0		
"	"	{Fifth (half-skim Cheese) (Nov. 1 to Nov. 15) ..}	1 3 11		50 0		
1892	Axbridge	First (April 1 to 30) .. ..	17 2 7	166 1 20	58 0	66 3	20.62
"	"	Second (May 1 to 31) .. ..	26 0 17		65 0		
"	"	Third (June 1 to Aug. 18)	58 3 6		68 0		
"	"	Fourth (Aug. 19 to Sept. 30)	40 1 3		70 0		
"	"	Fifth (Oct. 1 to Oct. 31) ..	23 2 15		70 0		
1893	Butleigh	First (April 1 to 30) .. ..	23 3 23	205 1 3	60 0	66 0	23.6
"	"	Second (May 1 to 31) .. ..	33 3 9		66 0		
"	"	Third (June 1 to July 31)	64 3 9		68 0		
"	"	Fourth (Aug. 1 to Sept. 30)	51 1 0		68 0		
"	"	Fifth (Oct. 1 to Oct. 31) ..	31 1 18		68 0		

The following table shows the number of students at the Society's Cheese Schools:—

## CHEESE SCHOOLS

Conducted by the Society from May 1st, 1890, to December 31st, 1893.

County.	Centre.	No. of days School was open.	Year.	No. of Students.						
				4 weeks.	3 weeks.	2 weeks.	10 days.	1 week.	Shorter Periods.	Total.
Somerset ..	{Palace Farm, Wells .. ..}	184	1890	5	1	6	..	51	28	91
" ..	{Vallis Farm, Frome .. ..}	229	1891	12	1	12	..	32	9	66
" ..	{Compton House Farm, Axbridge}	214	1892	14	..	5	2	16	2	39
" ..	{Rock's Lower Farm, Butleigh, Glastonbury ..}	214	1893	24	..	3	..	15	2	44
		841		55	2	26	2	114	41	240

Sums of 12*l.* 16*s.* 1*d.* in 1891, 8*l.* 3*s.* 7*d.* in 1892, and 2*l.* 13*s.* 6*d.* in 1893, were received for truckle cheeses and they butter made, in addition to the cheese referred to in the foregoing table, at the Schools.

The unusually large number of students who received a four-weeks' course of instruction is a very satisfactory feature of the 893 School.

The experimental section of the School, which was started in 1891, was continued during 1893; a laboratory and a scientific expert (Mr. F. J. Lloyd, F.C.S.), with a qualified assistant, being attached to it.

Detailed accounts of Mr. Lloyd's 'Observations' during the past year will be found further on in this volume.

The Board of Agriculture has testified its appreciation of the researches carried on at the Cheese School during 1893, by awarding a monetary grant in aid of them, and by reprinting, in the form of a Parliamentary Report, a considerable portion of the results and observations recorded in the Society's Journal of last year.

This year's Cheese School, which will be opened the first week in April, will be held at Mark House, near Highbridge, in Somersetshire. The farm and dairy are very suitable, and students will be boarded and lodged in the commodious residence attached, which is occupied by Mr. and Mrs. J. Peters. The Committee will have the advantage of Miss Cannon's services as teacher, and of the co-operation and help of Mr. Gibbons and Mr. Cannon in the supervision and general arrangements of the School. The practical section of the School will again be carried on by the Society for the Somerset County Council, and the Society will continue, on its own account, the Experimental Section, for bacteriological and other researches, under the conduct of Mr. Lloyd.

## XII.—*The Manufacture of Cheddar Cheese.* By T. C. CANDY, Cattistock, Dorset.

My method of cheese-making is the result of nine years of observation and experiment, and has been modified from time to time as experience showed me that it might be improved. The following is a brief description of my present system.

*Ripening of evening's milk.*—The first essential of success by this method is to secure in the evening's milk a proper degree of ripeness, for no sour whey is used during the manufacture, as is the case with some other methods.

In order to secure this ripeness, the evening's milk should never be allowed to get cold before it is brought into the dairy.



This is far more difficult when the milk has to be brought a longer distance than when the farm is close to the dairy. During the heat of summer, there is little likelihood of the milk cooling down too rapidly, but in the spring and autumn special care has to be taken to prevent the rapid cooling of the milk. The system I adopt is based upon the fact that the greater the surface of a liquid exposed to a cold atmosphere, the more rapid will be the cooling of that liquid. I have therefore two tall tin vessels, each holding about thirty-six gallons, into which the milk is placed when brought in at night. The temperature of the milk is then about 90° Fahr. To secure proper ripeness it should not fall below 78° Fahr. by 10 P.M., nor below 68° Fahr. by the morning. I object to the method of maintaining the temperature of the evening's milk by covering it up in the tub with a cloth. This I believe to be one cause of much trouble in cheese-making, while it keeps in the odour of the milk which had far better be allowed to escape.

If the milk has been properly kept and ripened over night it is not advisable to further carry on this ripening. Therefore the evening's milk is not used for heating in the morning, but the temperature of the mixed milk necessary for renneting is obtained by heating a portion of the morning's milk. The heat to which this portion of the morning's milk is raised should not exceed 100° Fahr.

*Renneting.*—The temperature for renneting is 84° Fahr. The quantity of rennet used is about one-teaspoonful to eight gallons of milk in the summer, and a little more in the spring and in the autumn.

Accurately measured, the proportion of rennet to the volume of milk is in the summer about one part to 8000, and in the autumn about one part to 7000. The amount of rennet used will also vary according to the ripeness of the milk. If the milk is very ripe, less than the above-mentioned quantity must be used; but if not quite ripe enough, more rennet must be used. To judge this, and many other points in the manufacture, needs long experience, and no hard and fast rule can be laid down at present to guide makers who have not the necessary experience.

After adding the rennet and stirring it in for some 5 or 6 minutes, the tub is covered with a cloth and the milk allowed to rest until set. To facilitate judging whether the milk is properly set or not, a bowl is left floating upon the top of the milk, and when the milk is sufficiently set the bowl, upon slightly raising one side, will come away from the curd quite clean.

If it does not, the milk must be allowed to rest longer before cutting. If the milk be properly ripened and the right amount

of rennet used, the curd should be set and ready to cut 45 minutes after adding the rennet.

*Turning in the surface.*—The top of the curd is now turned in or over by the use of a skimmer, the surface being cut to a depth of about two inches. The vat is covered with a cloth and allowed to remain until the whey rises. This should not take more than about 15 minutes.

*Breaking.*—This is now commenced, very gently to begin with. After first cutting the curd it is well to wait for a few minutes before proceeding with the breaking. The breaker used is the old English shovel breaker, the edges of which I like to have as sharp as possible, so that it cuts the curd rather than breaks it. Moreover, I consider it necessary to move the breaker upwards, thus cutting the curd by its own weight, rather than to move the breaker in a circular direction round the tub, and break the curd by overtaking it with the breaker. No operation in cheese-making needs more care than breaking.

A good curd should be fit to break in 60 minutes from the time rennet was first put in, and the time taken in breaking should be 50 minutes. This time will, however, be correct only when all the conditions are at their best. It will vary as the conditions of the curd vary. When breaking is completed, the curd is obtained in a very fine condition, yet, when skilfully done, without loss of fat. It should be angular and not rounded; not like shot, but in sharp-edged fragments.

When finally broken, the curd is allowed to settle, being moved backwards and forwards in a place from whence it is convenient to dip the whey for the scald.

*The Scalds.*—One of the chief characteristics of this system is the high scald to which the curd is subjected. This is obtained in the ordinary course by two scalds, but, when the cheese is going very fast, it may be necessary to have only one scald. In either case, it is essential that it should take as little time as possible to get the scald on, and to secure this, it is necessary to have proper means of heating the whey rapidly to the desired temperature. I use an ordinary boiler, the whey being heated in the vessels, previously described, in which the milk is ripened during the cool season, or else the whey is lipped out into large warmers, and these placed in the boiler. While the first warmer is being heated the second is being filled, and the whole of the whey is dipped off as far as possible before any of the heated whey is put on the curd. By this means it is possible with one boiler to get the first scald on in about 15 minutes when dealing, say, with 160 gallons of milk. But when a larger quantity of milk is being dealt with, it is advisable to have two boilers for heating the whey. The temperature of the first scald is 94° Fahr. The whey to obtain

this scald need not be heated above 120° Fahr. The curd is stirred in the scald for 2 minutes, and then allowed to settle. As soon as possible the whey is again dipped off for the second scald. The whey is heated to 126° Fahr., and in about 15 minutes it is possible to have the curd in second scald at a temperature of 106° Fahr. Very little change is made in the temperature of the scalds to meet the varying ripeness of the milk; but, when the milk is not quite so ripe as could be wished, it is permissible to use a slightly lower scald.

The curd is stirred in this scald for 3 minutes, and then allowed to settle for 15 minutes. The curd now lies on the bottom of the tub in a uniform layer. It must next be moved up from the sides of the tub towards the centre by gentle yet firm pressure with the flat of the hands. Skill and care are necessary to properly carry out this operation. The curd should be left in a solid mass in the centre of the tub, with a space of about six inches between the sides of the tub and the edge of the curd, and yet without any small pieces of curd, which have been broken off from the mass, floating in the whey. After this has been done the curd is again allowed to rest, and should be fit to permit the whey being drawn 30 minutes after the second scald was on.

Here, again, experience must determine whether the condition of the curd will permit the whey to remain on for 30 minutes, or whether it will be necessary to keep it on for a longer time. When all goes well the curd acquires in the 30 minutes a consistency which the experienced maker soon learns to judge. But this state may be reached in less time, especially in very warm weather, or when the milk is unusually ripe; or, on the other hand, when the conditions are reversed, it may take longer.

*Cutting the Curd.*—As soon as the whey is off, the curd lying on the bottom of the tub is cut into foot squares and turned over, the outer squares being placed on edge, and resting against the interior ones. They are then covered with a cloth or thin cloths, and left for some minutes—the time varies, and is judged by the condition of the curd. The shorter the time—say 5 minutes—the better the curd, and the resulting cheese. Each square of curd is now cut into two pieces and taken to the cooler. If the acidity is low, these slices are placed close together to keep in the heat; but if the acidity is developing rapidly, they are not packed closely. The curd is covered with light cloths only. The curd is turned upon the cooler after 20 minutes, again after 30 minutes, and once again before cutting. It is then cut into pieces 3 inches square, packed closely and covered with a cloth. It is opened up and turned at the end of 20 minutes, again at the end of 30 minutes, and again opened and moved at the end of 40 minutes.

The curd is ground at 5.30 P.M., then spread over the cooler, covered with cloths and left till about 8 P.M., when it is salted—2½ lbs. of salt being used for each hundredweight of cheese—and, if a firm curd, vatted. If the curd is soft, it should remain 10 to 15 minutes on the cooler after being salted and before being vatted. The temperature of the curd when vatted should be 70° Fahr., and the full weight of the press should not be put on until the curd has been in the press for 60 minutes.

Such is a brief outline of the system as carried out under the most favourable circumstances. But every operation will need careful attention and have to be varied according to the weather and ripeness of the milk, in order to obtain uniform results in the cheeses. It is upon the knowledge and skill which the maker possesses, in judging the condition of the curd at each stage, and in knowing how to vary the operations of manufacture to meet those conditions, that success depends in this, as in every other, system of cheese-making.

### XIII.—*Observations on Cheddar Cheese-making. Report for 1893.*

By F. J. LLOYD, F.C.S.

THERE are certain soils or farms in England, especially in Somerset, upon which, if tradition can be believed, there are spectre sign-boards bearing the words, "Good cheese cannot be made here." Unfortunately, no one is able to see these signs except the tenant for the time being. But the belief in the inability to make good cheese on certain soils is so wide-spread, and the conviction that it is founded upon fact is so strong, that the subject deserves careful attention and enquiry. Some people have said that the Society always selected a site for its Cheese School where it was possible to make not only good but the best cheese, but that if a site were selected where good cheese had not been made before, they would find out that it was impossible to make good cheese on such soil.

In 1892 such a site was selected, the milk being produced off alluvial land overlying peat; and in 1893 the Committee again determined to select such a site, with the result that a farm was chosen, known as the "Lower Rock Farm," situate at Butleigh, about four miles from Glastonbury station, on the property of Mr. R. Neville Grenville.

Now, as the prices fetched by the cheeses made at the Dairy School (which have already been published) averaged from June to October 68s. per cwt. and 66s. per cwt. for the season, it might be inferred that no difficulty was found in making cheese upon this site. Such supposition would be far from the truth. The difficulties were great, and such as had not

been met with during the two preceding years. Although these difficulties fluctuated from day to day, being at times very great, at others only slight, and this even when the cows were on the same pasture, yet as a matter of fact they were nearly always present. All the skill and experience, which Miss Cannon possesses in an exceptional degree, were needed to cope with them, and I can quite believe that an ordinary cheese-maker would find such difficulties insurmountable.

Before entering further into this question, however, I will proceed with my Report, and observing the same order as hitherto, consider first

# I.—THE CONDITIONS UNDER WHICH THE CHEESES WERE MADE.

## THE FARMS AND SOILS.

The house and some of the fields lie upon high ground, but the fields upon which the cattle were pastured for the greater portion of the time were on the low-lying lands which border the river Brue. This part of the county is noted for certain land, which is termed the scouring land of Somerset, to be referred to again later on in this Report. The cattle were never fed upon this scouring land. The dairy was rather small, and had a low roof; the walls were whitewashed, and also the ceiling.

The number of cows kept by Mr. Bethell, the tenant of Lower Rock Farm, was not sufficient to supply all the milk required, so that some of the milk had to be supplied by Mr. Hunt, tenant of Bridge Farm, whose fields adjoin Mr. Bethell's. Both Mr. Bethell and Mr. Hunt were, so far as I could gather, firmly convinced that no good cheese would be made from their land. Moreover, they pointed out among the fields certain which were noted as causing the milk to be unsuitable for cheese-making. It was evident that, if this were so, the cause might reasonably be expected to be found in the nature of the herbage growing upon the land. Mr. Carruthers was therefore requested to visit the farm and inspect the herbage, which he did on the 27th June.

Mr. Bethell, Mr. Hunt, myself, and assistant went with Mr. Carruthers over the land, and tried our best to discover any or what difference there might be between the grasses and plants on the different fields. The following is Mr. Carruthers' Report:—

## REPORT OF PROFESSOR CARRUTHERS, F.R.S., ON THE VEGETATION OF THE TWO FARMS WHICH SUPPLY THE MILK FOR THE DAIRY SCHOOL.

I visited these farms on the 27th June, and examined with care the vegetation of the ten fields in which the milch cows graze. All these fields are on the flat alluvium of the valley,

which consists throughout of a fairly uniform stiff loam. With but slight modification, the vegetation is also singularly uniform.

The principal grasses are wild barley grass, broom grass, rye grass, and false florin. Less frequently are found meadow fescue, tall fescue, sheep's fescue, cocksfoot, and Yorkshire fog. The most abundant grasses are those of inferior quality, but the rich alluvial soil produces a vigorous growth on which the cows thrive. The only grasses that are permitted by the stock to run to seed are rye grass, barley grass, and false florin; very few heads were to be seen, the whole pasture being very closely eaten down.

A fair amount of white clover exists in all the fields, being very thick in some places. A few scattered plants of red clover are present in all the fields. There was a considerable quantity of the yellow bird's foot trefoil on Mr. Hunt's farm.

The most abundant weed was buttercup; this weed was specially observed in Lower Rock Farm. There was an absence of yarrow in all the fields of this farm. On the other hand, yarrow was present in all the fields of Mr. Hunt's farm, and with it "all-heal" and some thistles. One field on this farm contains a good deal of yellow rattle.

I compared the vegetation of the fields which (it was said) always supplied good milk with that in the fields in which the milk was of inferior quality, and made inferior cheese. There was no difference in the vegetation to account for the difference in the quality of the milk.

I believe Mr. Lloyd is prosecuting researches which will determine the real cause of the injury to the milk. He has already discovered several different bacteria in the milk and cheese, besides that which is necessary for the production of the cheese. The separate and pure culture of these organisms which Mr. Lloyd is carrying on, and the experiments of adding these pure cultures to good milk, must lead to important results.

4th July, 1893.

(Signed) WILLIAM CARRUTHERS.

The fields were ten in number, and of various sizes. I found the soils very similar in appearance, and Mr. Carruthers, as will be seen from his Report, formed the same opinion. Samples of the soil were taken from every field, but subsequently I selected only a few of the most typical samples.

Thus the "Thirty acres" of Mr. Bethell was a little lighter in colour and more ferruginous than the other soils. It was considered the best of all the fields. Hyatt's Common, which was considered the worst field, appeared identical with Mr. Bethell's worst field known as "Horses." The other soils were very similar; but I selected two which appeared to me least like one another.

These four samples of soil were then forwarded to Dr.

Voelcker, and it will be seen from his Report that chemically, and as regards fertility, the "Thirty acres" is the best soil, and "Hyatt's Common" the worst soil.

# REPORT OF DR. VOELCKER ON THE SOILS.

Analytical Laboratory,  
22, Tudor Street,  
New Bridge Street, London.  
September 13th, 1893.

The four samples of soil from fields at the Cheese School at Butleigh were duly submitted by me to analyse, and gave the following results:—

Soil dried at 212° F.	1. Inside Common, considered the poorest of 3 Commons, mainly sub- soil, 2-8 in.	2. Hyatt's Common, Mr. Hunt.	3. Clappe Corner Common.	4. Thirty Acres.
Organic matter and loss on heating .. .. .	17.48	14.69	19.54	20.88
Ferric oxide .. .. .	5.20	7.17	4.88	6.36
Ferrous oxide .. .. .	2.01	.88	1.28	1.03
Alumina .. .. .	13.93	8.41	13.63	15.10
Lime .. .. .	.87	1.30	.99	.89
Magnesia .. .. .	1.10	.90	1.03	.90
Potash .. .. .	1.02	.85	1.02	1.45
Soda .. .. .	.24	.34	.56	.92
Phosphoric acid .. .. .	.36	.41	.37	.40
Sulphuric acid .. .. .	.16	.15	.17	.14
Insoluble silicates and sand ..	57.63	64.90	56.53	51.93
	100.00	100.00	100.00	100.00
Nitrogen .. .. .	.61	.55	.73	.81
Equal to ammonia .. .. .	.74	.67	.89	.98
Nitric acid .. .. .	.008	.008	.008	.008

Each soil contained a trace of chlorides, but not more. The four soils were very similar in appearance, and are all of a distinctly clayey nature.

Although, as is but natural in the case of different samples, the four soils show in their respective analysis certain small differences of chemical composition, yet it must be said generally that they resemble one another very fairly indeed, and, so far as I can see, there is no such striking variation between any one of them and another as to in this way account for the superiority claimed locally for this or that soil.

The most marked difference which occurs is in the small quantity of alumina in No. 2, and in the slightly increased

amount of lime which it contains. This soil would appear to be somewhat the lightest of the four.

The fact that No. 1 shows a larger proportion of ferrous oxide than any of the others, may possibly be taken as some indication of its being in a less fully oxidised condition, and this may have to do with its being considered the poorest of the three common soils. Beyond this, I see no possible reason, on the chemical side at least, to account for inferiority in it.

I should not at the same time be surprised to hear that No. 2 was reckoned the better soil, owing to its being lighter, to the larger amount of lime in it, richness in phosphoric acid, and more fully oxidised state of its iron salts.

All four soils are very rich alike in phosphoric acid, potash, and nitrogenous organic matter, and the differences in any of these shown by the respective soils are not sufficiently marked to account for any superiority of one over the other.

(Signed) J. AUGUSTUS VOELCKER.

It will thus be seen that neither a botanical examination of the herbage, nor yet a chemical examination of the soils, found any reason for the local opinion as to the unsuitability of the land for cheese-making, nor did they throw any light on the difficulty met with in practice.

#### THE STOCK AND YIELD OF MILK.

On the 1st April there were 38 cows in milk, 21 belonging to Mr. Bethell, and 17 to Mr. Hunt. They were then being stall fed, Mr. Bethell's cows receiving six pounds of cotton-cake per diem and mangels, and Mr. Hunt's a little less cake but additional hay. Soon after the cheese-making began, they were turned out to grass in the home fields, and on the 25th April went down to "The Moor," owing to the exceptionally warm season. They were, however, given some compound cake for some little time afterwards. On the 18th April there were 42 cows in milk, 24 of Mr. Bethell's, and 18 of Mr. Hunt's; and on the 29th, Mr. Bethell had 25, and Mr. Hunt 19 in milk. On the 11th May they were increased to 52, and on the 25th there were 55 in milk. The number remained about the same for the rest of the period. They were mostly Shorthorns; and the average yield from Mr. Bethell's cows was greater than that from Mr. Hunt's. This Mr. Bethell attributed to the fact that he took great care in selecting the cows, and got rid of those which he found to yield less than he considered a fair amount of milk. The cattle drank from the river Brue, which, in spite of the very dry season, always afforded them an ample supply of water of good quality.



The season, as is well known, was an exceptional one, and the result thereof is seen in many ways.

First. The effect of the warmth was already felt in April. Thus in 1892 the average time of vatting in that month was 6.58 P.M., while in 1893 the average time was 4.34 P.M., nearly  $2\frac{1}{2}$  hours sooner. That this was due to the heat is shown by the fact that the average temperature of the dairy in 1892 was 54–60°, and in 1893 from 59–68°. It is also seen by comparing the average temperature of the curd when in vat, which in 1892 was 67° Fahr., while in 1893 it was 76° Fahr.

Secondly. If we compare the average results obtained at Butleigh in 1893 with those obtained at Vallis and Axbridge in 1891 and 1892, as given in the following table, it will be seen that the yield of milk, owing to the shortness of keep, declined in June, and still further in July, while in each of the preceding years it rose in June very considerably, and even in July was in one case more than, and in the other nearly equal to, the yield in May (see table opposite).

Great as was the influence of the heat, even as seen when we compare the monthly average of milk, it was greater still when we compare the yield week by week. Indeed, the fluctuations were quite remarkable, the yield sometimes rising, and then again falling in a manner not easily to be accounted for.

The following facts are of interest as showing the effect of the drought, and they also indicate how very rapidly under such circumstances the cows felt the effect of the change produced in the food. The milk supply on the whole gradually decreased from the end of May. During the last week of May the cows were yielding about 160 gallons of milk. From that date no rain to speak of fell until the 22nd and 23rd June (see table, p. 139). The average yield of milk for the week preceding this fall was 131.7 gallons per day, but for the week after it rose to 137.1 gallons per day. Then it began to diminish, until on the 11th July it amounted to only 126 gallons. A slight fall of rain on this day, followed by another on 15th and again on 19th, had such effect that whereas the average yield for the first ten days in the month was only 130.6 gallons per day, the average daily yield for the last ten days was 142.9 gallons.

The effect of the season on the quality of the milk was also most marked. Thus, while in April of each year the amount of cheese made from one gallon of milk has been practically identical (see table, p. 137), and in former years has increased every month, yet in 1893, after slightly increasing in May, it actually fell again in June, and in July and August was less than in either of the preceding years. We are justified therefore in concluding that, both in quality as well as in quantity, the milk was diminished by the prolonged drought.

## AVERAGE RESULTS OBTAINED IN 1891, 1892, AND 1893.

Month.	VALLIS, 1891.					AXBRIDGE, 1892.					BUTLIGH, 1893.				
	Vol. of Milk.	Cheese taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of Milk.	Vol. of Milk.	Cheese taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of Milk.	Vol. of Milk.	Cheese taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of milk.
April .. .. .	81	73	69	4	.85	79	70	66	4	.83	106	96	89	7	.84
May .. .. .	119	117	111	6	.93	109	102	94	8	.86	149	142	132	10	.88
June .. .. .	132	132	123	9	.93	127	122	113	9	.90	141	130	121½	8½	.85
July .. .. .	112	114	107	7	.96	116	115	108	7	.93	134	129	122	7	.91
August .. .. .	91	99	91	8	1.00	100	102½	94	8½	.94	134	131½	124	7½	.92
September .. .. .	79	87½	82	5½	1.04	84	91	85	6	1.01	102½	109½	104	5½	1.02
October .. .. .	52	64	59½	4½	1.14	58	68	62	6	1.07	68	80	77	3	1.13

Being anxious to discover what effect the drought was having upon the composition of the milk yielded at Vallis and Axbridge, where the Cheese School was held in 1891 and 1892, I wrote to Mr. Armstrong and Mr. Tilley asking for samples. These they very kindly forwarded. Unfortunately, the time taken in the transit of these samples was so long, and the heat so great, that sometimes when they reached me they were curdled, and a full and satisfactory analysis could not be made.

The following are the results obtained, and they are interesting:—

**AVERAGE COMPOSITION OF MILK FROM VALLIS, AXBRIDGE, AND BUTLEIGH, between 19th and 24th May, 1893.**

Milk from—						Fat.	Casein, &c.	Solids.
Vallis ..	..	..	..	..	..	3·08	8·86	11·94
Axbridge ..	..	..	..	..	..	3·16	8·91	12·07
„ in 1892 ..	..	..	..	..	..	3·25	8·95	12·20
Butleigh ..	..	..	..	..	..	3·18	8·98	12·16

It is noteworthy that the milk from Vallis, which in an ordinary season, as shown by the results in 1891 (see table, p. 137), is richer than that yielded at Axbridge, or than that yielded in 1893 at Butleigh, was poorer in May last than the milk at either Axbridge or Butleigh. The reason of this is doubtless the fact that high ground like that at Vallis felt the drought and heat more than the moor lands of Axbridge and Butleigh. In the milk from these soils there was remarkable similarity.

We can also compare the milk yielded at Vallis, Axbridge, and Butleigh for the later portion of the season during the three years.

**COMPOSITION OF MILK AT VALLIS, AXBRIDGE, AND BUTLEIGH COMPARED.**

						Fat.	Casein, &c.	Solids.
1891.	Vallis, 1st week in September, 4-9	..	..	..	..	4·15	8·76	12·91
1892.	Axbridge „ „ „	..	..	..	..	3·50	8·96	12·46
1893.	Butleigh „ „ „	..	..	..	..	3·53	9·00	12·53
1891.	Vallis, 1st week in October, 2-7	..	..	..	..	4·39	9·08	13·47
1892.	Axbridge „ „ „	..	..	..	..	3·87	9·08	12·95
1893.	Butleigh „ „ „	..	..	..	..	4·30	9·19	13·49

It will be seen that the composition of the milk at Butleigh in September was again very similar to that yielded at Axbridge during the same month of 1892. And the rapid rise in quality of the milk at Butleigh in October is due to the equally rapid and exceptional fall in the quantity yielded, and is therefore no criterion of the influence of the land or the pastures or the season.

Reference will be made subsequently to other influences and effects which may in part be attributed to the season.

The following table, for which I am indebted to Mr. Neville Irenville, shows the rainfall as recorded by him at Butleigh, during the seven months of the observations.

RAINFALL AT BUTLEIGH, 1893.

	April.	May.	June.	July.	August.	September.	October.
	in.	in.	in.	in.	in.	in.	in.
1	·03	·03	..	..	·02	..	·09
2	..	..	..	..	..	..	·60
3	..	..	..	..	·41	..	·08
4	..	..	·08	·54	·21	..	..
5	..	..	·03	..	..	..	·32
6	..	..	..	..	·06	·42	·30
7	..	..	..	..	..	·03	·40
8	..	..	..	·15	..	·55	·12
9	..	..	..	·10	..	..	·03
10	..	..	..	·08	..	..	·29
11	..	..	..	·41	·04	..	·20
12	..	..	..	·12	..	..	..
13	..	..	·04	·25	..	..	·07
14	..	·07	..	..	..	..	·19
15	..	·03	..	·79	..	..	..
16	·03	·17	..	..	..	..	·06
17	..	·19	..	·10	..	·06	·15
18	..	·20	..	·02	·10	·17	..
19	..	·05	..	·85	..	·25	..
20	..	..	..	..	·23	·06	..
21	..	..	..	·10	..	..	·12
22	..	·03	·30	..	·28	·21	·03
23	·02	·09	·40	·41	..	·13	..
24	..	..	·10	..	..	..	..
25	..	..	·04	·05	..	..	·19
26	..	..	·15	..	..	·15	·37
27	..	..	·17	..	..	·05	..
28	..	..	..	..	..	·36	·05
29	·09	·02	..	..	..	·11	..
30	..	..	..	·09	..	·05	..
31	..	..	..	·06	·08	..	..
total inches	·17	·88	1·31	4·12	1·43	2·60	3·66

## II.—THE RECORD OF OBSERVATIONS.

The same tables were used for recording observations as in preceding years; but, as greater attention was paid this year to the bacteriological work, the results were not recorded every day, and after May were only made when necessary, though completely for the first week in each month. The results of these observations are shown in the following tables, though many which were made are not given, but will be stated where necessary, should reference be made to them subsequently:—

## RECORD OF OBSERVATIONS MADE AT THE BATH AND

1	2	3	4	5	6	7	9	10	11	
RELATING TO EVENING'S MILK.										
Day of Month.	Name of Field.	Volume of Milk.	At Night.				In Morning.			
			Time.	Temp. of Dairy.	Temp. of Milk.	Acidity.	Temp. of Dairy.		Temp. of Milk.	Acidity.
							m/n.	max.		
2-3	{ Stall fed, and Home Field }	galls. ..	p.m. ..	..	..	..	54	62	..	..
3-4	Ditto . . . . .	37	6.20	66	86	·16	58	61	71	·18
4-5	Ditto . . . . .	42	6.25	64	86	·16	56	64	69	·18
5-6	{ Beggar's Well, Park Gates }	42	6.15	64	85	·18	60	79	68	·19
6-7	Ditto . . . . .	47	6.0	65	91	·18	56	65	68	·18
7-8	Ditto . . . . .	48	6.5	65	89	·18	56	66	63	·19
8-9										
9-10	Ditto . . . . .	45	4.35	64	86	·18	57	65	62	·19
10-11	Ditto . . . . .	50	6.15	64	87	·18	57	65	64	..
11-12	Ditto . . . . .	53	6.10	59	83	·19	53	61	60	·20
12-13	Ditto . . . . .	50	6.5	60	86	·19	52	61	60	·20
13-14	Ditto . . . . .	54	6.15	59	86	·19	52	61	61	·19
14-15	Ditto . . . . .	52	6.5	58	86	·19	50	60	60	·19
15-16										
16-17	Ditto . . . . .	48	4.40	61	87	·18	56	61	62	·19
17-18	Ditto . . . . .	50	5.55	61	87	·19	56	62	63	·19
18-19	Morning's milk only used.									
19-20	Ditto . . . . .	49	6.5	66	85	·18	59	66	65	·19
20-21	Ditto . . . . .	50	6.5	68	91	·19	61	68	66	·19
21-22	Ditto . . . . .	50	6.10	69	89	·19	61	69	68	·19
22-23										
23-24	Ditto . . . . .	44	4.50	69	88	·18	59	69	63	·19
24-25	{ Thirty acres, Common Mead }	49	6.10	67	88	·18	58	72	64	·18
25-26	Ditto . . . . .	61	6.10	69	92	·18	61	70	69	·18
26-27	Ditto . . . . .	61	6.15	69	90	·19	60	69	67	·19
27-28	Ditto . . . . .	63	6.30	67	90	·19	57	67	66	·19
28-29	Ditto . . . . .	61	6.20	66	88	·19	59	70	66	·19
29-30	Ditto . . . . .	60	6.20	63	85	·19	57	64	64	·19
Average . . . . .		50	..	64	87	·18	57	65	65	·19

## ST OF ENGLAND SOCIETY'S CHEESE SCHOOL, APRIL, 1893.

	12	13	14	15	16	17	18	19	20	21	22	23
MORNING'S MILK.			MILK HEATED			STALE WHEAT.		RELATING TO MIXED MILK, &c.				
Name of Field.	Vol. of Milk.	Acidity.	Total Vol. of Milk.	Quantity.	Temp.	Vol.	Acidity.	Acidity before Ren-netting.	Time of Ren-netting.	Rennet added.		
	galls.		galls.	galls.		galls.			A.M.	ounce-s.	Pro-portion.	
Med, and Home	..	..	80	25	90	none	..	..	7.28	1.42	9014	
ld . . . . .	44	.18	81	23	87	none	..	.18	7.32	1.44	9000	
o . . . . .	46	.18	88	25	86	4	.38	.19	7.27	1.56	9025	
gar's Well, }	44	.17	86	28	90	none	..	.19	7.10	1.52	9052	
rk Gates . . . }	55	.18	102	30	90	none	..	.19	8.15	1.81	9016	
o . . . . .	54	.18	102	32	90	none	..	.19	7.37	1.81	9016	
o . . . . .	62	.19	107	29	88	2	.22	.19	7.20	1.90	9010	
n . . . . .	56	.19	106	45	90	2	.37	.19	7.27	1.88	9021	
n . . . . .	58	.19	111	44	90	2	.38	.20	7.45	1.97	9015	
o . . . . .	60	.19	110	40	90	3	.29	.19	8.14	1.93	8979	
o . . . . .	60	.18	114	45	90	3	.39	.19	7.40	2.02	9029	
o . . . . .	59	.19	111	42	88	3	.40	.19	7.20	1.97	9015	
o . . . . .	65	.19	113	40	81	3	.41	.19	7.8	2.00	9040	
o . . . . .	60	.17	110	34	83	3	.40	.19	7.12	1.95	9025	
o . . . . .	60	.18	60	none	..	2½	.42	.19	7.55	1.06	9056	
o . . . . .	58	.19	107	40	81	2	.42	.18	6.55	1.90	9010	
o . . . . .	56	.20	106	37	84	2	.43	.18	7.10	1.88	9021	
o . . . . .	56	.18	106	34	90	2	.42	.18	7.15	1.88	9021	
o . . . . .	60	.20	104	34	84	3	.43	.18	7.5	1.84	9013	
ty acres, Com- }	55	.19	104	35	90	3	.45	.18	7.26	1.84	9043	
u Mead . . . }	63	.19	124	43	88	3	.45	.19	7.22	2.25	8817	
o . . . . .	64	.19	125	42	90	3	.45	.19	7.22	2.27	8810	
o . . . . .	67	.20	130	46	90	2	.46	.21	7.50	2.35	8851	
o . . . . .	71	.19	132	45	88	2	.44	.19	7.34	2.38	9000	
o . . . . .	72	.19	132	43	90	1½	.45	.20	7.25	2.38	9000	
	59	.19	106	..	..	..	.40	.19	7.30	1.89	8997	

## RECORD OF OBSERVATIONS MADE AT THE BATH AND

	24	25	26	27	28	29	30	31	32	33	34	34a	35
Day of month.	Time when Curd cut.	Acidity of Whey before Breaking.	Time of Breaking.	Acidity of Whey put aside.	Time Scalding commences.	Temp. of Scald.		Time taken in Stirring.	Time in Scald.	RELATIVE TO WHEY.			
						1st.	2nd.			Temp. when drawn.	Acidity.	Volume.	Acidity of draining from piles Curd.
	A.M.		A.M.		A.M.			min.	h. m.			galls.	
2-3	8.30	·11	9.10	·13	10.8	88	92	30	2 0	88	·12	..	·15
3-4	8.32	·11	9.10	·14	10.23	88	92	30	2 12	90	·13	..	·16
4-5	8.27	·13	8.48	·14	9.40	88	91	20	1 20	89	·17	..	·30
5-6	7.55	·12	8.20	·14	9.42	88	91	12	1 7	90	·19	..	·31
6-7	9.15	·13	9.40	·13	10.45	88	92	20	1 12	89	·17	..	·27
7-8	8.37	·13	9.10	·13	10.5	88	92	45	2 0	88	·13	..	·15
8-9													
9-10	8.23	·13	8.50	·13	9.50	88	92	40	1 40	89	·15	..	·20
10-11	8.25	·12	8.50	·13	9.43	88	92	60	1 57	87	·16	..	·23
11-12	8.30	·13	9.0	·13	10.0	88	92	50	1 45	87	·15	..	·18
12-13	9.0	·12	9.27	·13	10.25	88	92	55	1 50	87	·17	..	·23
13-14	8.35	·13	9.0	·13	10.6	88	92	35	1 28	88	·19	..	·24
14-15	8.15	·13	8.42	·14	9.38	88	92	42	1 32	88	·16	..	·19
15-16													
16-17	7.55	·12	8.20	·13	9.15	88	92	49	1 40	88	·16	..	·22
17-18	7.57	·13	8.25	·13	9.20	88	92	45	1 35	89	·15	..	·19
18-19	8.37	·13	8.50	·14	9.42	88	92	60	1 53	87	·17	..	·20
19-20	7.55	·12	8.20	·13	9.15	88	92	40	2 5	89	·16	..	·20
20-21	8.10	·12	8.30	·13	9.50	88	92	50	1 40	89	·15	..	·19
21-22	8.15	·12	8.35	·13	9.34	88	92	42	1 31	89	·15	..	·18
22-23													
23-24	8.0	·13	8.17	·14	9.13	88	92	56	1 42	88	·16	95	·20
24-25	8.25	·13	8.50	·14	9.55	88	92	42	1 35	87	·17	100	·21
25-26	8.8	·13	8.30	·14	9.15	88	92	40	1 40	88	·25	118	·30
26-27	8.7	·14	8.25	·14	9.18	88	92	30	1 28	89	·18	119	·23
27-28	8.43	·13	9.5	·14	10.7	88	92	30	1 20	88	·19	122	·23
28-29	8.20	·13	8.35	·13	9.31	88	92	34	1 26	89	·16	124	·21
29-30	8.12	·14	8.30	·14	9.33	88	92	30	1 28	88	·18	125	·21
Average ..		·13	..	·14	..	88	92	39	1 45	88	·16	115	·21

F ENGLAND SOCIEY'S CHEESE SCHOOL, APRIL, 1893.—*contd.*

37	38	39	40	41	42	43	44	45	46	47	48	49	
Time Curd is taken from Tub.	Temp. of Curd when taken from Tub.	ACIDITY OF WHET DURING TREATMENT OF CURD.								Acidity of Curd when Milled.	SALT ADDED.		Temp. of Dairy.
		When taken to Cooler.	After 1st Cut- ting.	After 2nd Cut- ting.	After 1st Turn- ing.	After 2nd Turn- ing.	After 3rd Turn- ing.	After 4th Turn- ing.	Weight.		Per- centage.		
												lbs. oz.	
2.0	87	..	..	·42	·61	·83	..	..	..	1 10	2·15	56	67
2.15	..	·26	·37	·53	·65	·77	..	..	..	1 10	2·16	64	66
1.48	90	·48	·66	·80	..	..	..	..	3.00	1 12	2·02	58	67
1.15	90	·41	·59	·70	·81	..	..	..	..	1 12	2·03	62	68
2.50	90	·47	·70	·92	..	..	..	..	2·80	2 1	2·08	58	69
1.45	86	·23	·37	·63	·80	..	..	..	2·60	2 1	2·00	58	66
2.30	87	·33	·51	·74	·94	..	..	..	3·00	2 3	2·06	59	68
2.45	86	·39	·57	·84	·99	..	..	..	4·20	2 3	2·00	59	64
2.47	87	·20	·26	·45	·78	·89	..	..	3·80	2 4	2·00	54	64
1.10	88	·38	·64	·88	·98	..	..	..	4·40	2 4	1·99	54	64
2.30	90	·42	·64	·89	1·03	..	..	..	4·10	2 6	2·02	53	63
2.15	88	·30	·40	·60	·75	·96	..	..	..	2 4	2·00	54	64
2.10	89	·36	·56	·74	·92	·95	..	..	3·60	2 6	2·12	58	65
2.0	88	·30	·46	·68	·87	·98	..	..	3·20	2 6	2·13	58	68
2.24	88	·28	·38	·57	·62	·73	·81	·85	3·20	1 4	2·25	59	68
2.15	89	·35	·51	·77	·90	1·07	..	..	5·00	2 5	2·22	58	72
2.30	89	·27	·42	·62	·79	·96	..	..	2·60	2 4	2·21	63	73
2.8	89	·25	·35	·51	·67	·82	·91	..	2·60	2 4	2·21	61	73
2.2	87	·28	·43	·69	·84	·96	..	..	3·00	2 2	2·06	61	72
2.35	89	·36	·68	·82	·99	..	..	..	4·20	2 2	1·98	61	72
1.45	90	·40	·66	·87	1·04	..	..	..	..	2 10	2·09	62	72
1.35	90	·38	·65	·94	..	..	..	..	2·40	2 10	2·01	62	70
2.32	90	·44	·71	·95	..	..	..	..	2·20	2 11	2·00	61	70
1.52	89	·34	·51	·71	·89	1·04	..	..	3·00	2 11	2·02	60	70
2.0	89	·35	·53	·76	·95	..	..	..	2·00	2 11	1·95	62	68
2.29	89								3·11	2 3	2·07	59	68



RECORD OF OBSERVATIONS, APRIL, 1893.—*continued.*

	50	51	52	53	54	55	56	57	58	59					
y of mth.	RELATING TO CURD.			RELATING TO CHEESES.											
	Temp. in Wat.	Weight when Vatted.	Time of Vatting.	Acidity of liquid from Press.	Weight taken to Cheese Room.	Loss in Press.	Temp. of Cheese Room.				Hygrometer Reading.				
							Morning.		Evening.		Morning.		Evening.		
							Min.	Max.	Min.	Max.	Wet.	Dry.	Wet.	Dry.	
-3	72	lbs. 75½	P.M. 10.50	per cent. 1.00	lbs. 70	lbs. 5½									
-4	73	75	9.30	.90	70½	4½									
-5	78	86½	2.0	1.04	78½	8	58	70	59	62	56½	60	59½	62½	
-6	77	86	1.15	.97	80	6	60	62	60	63	59	62	61	64	
-7	76	99	3.40	1.06	92	7	60	63	63	63	58	61	62	65	
-8	74	103	7.5	1.04	97	6	60	63	60	63	59	62	60	64	
-9															
-10	77	106	4.30	1.15	100	6	59	63	60	63	58	61	61	64	
-11	74	109	4.0	1.09	102	7	60	63	60	61	58	61	58	61	
-12	69	112½	7.30	1.02	107½	5	58	61	58	60	55	59	59	61	1
-13	75	113	4.30	1.18	105½	7½	56	60	56	58	55	58	57	60	
-14	74	117½	3.45	1.21	111	6½	54	58	56	59	53	56	57	59	1
-15	74	112½	4.25	1.10	105½	7	54	58	55	58	53	56	56	59	
-16															
-17	74	112	3.40	1.11	104	8	55	58	56	58	55	58	57	60	
-18	76	111½	4.5	1.12	102	9½	56	58	57	60	56	58½	59	61	
-19	74	55½	5.25	1.13	51	4½	58	60	58	62	57	60	60	63	
-20	78	104	4.15	1.10	95	9	60	62	61	65	59	62	63	65½	
-21	76	101½	4.40	1.07	93½	8	63	66	63	66	61	64	64	67	
-22	76	101½	4.30	1.06	93½	8	64	66	64	67	62	66	64	68	
-23															
-24	77	103	4.5	1.06	94	9	65	68	65	68	62½	66	65	69	
-25	78	107	3.50	1.14	97½	9½	65	68	65	68	62½	66	65	69	
-26	79	125½	3.0	1.20	114½	11	66	68	66	68	64	67	65	69	1
-27	79	130	2.6	1.12	119	11	66	68	65	68	63	67	65	69	1
-28	79	134	3.0	1.07	123½	10½	64	65	65	68	63	67	66	69	1
-29	76	133	3.30	1.07	125½	7½	65	68	65	67	63	66	62	67	1
-30	75	137½	3.15	1.05	125½	12	64	66	64	65	61	65	61	66	1
..	76	106	4.34	1.08	98.3	7.7	60	63	60	63	59	62	61	64	

## RECORD OF ANALYSES—APRIL, 1893.

Day of Month.	COMPOSITION OF MILK.						COMPOSITION OF WHEY.			COMPOSITION OF CURD.			
							Solids.	Fat.	Ash.	Water.	Solids.	Fat.	Ash.
	Water.	Solids.	Fat.	Caseln.	Albumin.	Sugar.							
2-3	88.38	11.62	3.05	2.06	.32	5.49	6.98	.44	.54	..	..	..	..
3-4	88.36	11.64	3.04	2.92	.32	4.70	6.90	.45	.54	..	..	..	..
4-5	88.22	11.78	2.87	2.28	.33	5.52	6.83	.51	.59	40.65	59.35	30.03	2.00
5-6	88.32	11.68	3.00	2.21	.35	5.42	6.85	.51	.57	43.80	56.70	29.70	1.90
6-7	88.40	11.60	2.87	2.33	.29	5.43	6.85	.43	.55	41.95	58.05	28.56	2.00
7-8	88.02	11.98	3.10	2.46	.29	5.43	6.87	.39	.54	42.05	57.95	28.98	2.15
8-9	..	..	..	..	..	..	..	..	..	..	..	..	..
9-10	88.18	11.82	2.96	2.50	.32	5.32	6.84	.32	.56	42.20	57.80	28.44	2.10
10-11	88.00	12.00	3.20	2.42	.33	5.41	6.90	.49	.55	41.80	58.20	29.98	2.05
11-12	87.90	12.10	3.16	2.48	.33	5.47	6.94	.34	.55	41.05	58.95	29.97	2.05
12-13	88.00	12.00	3.11	2.53	.35	5.38	6.98	.27	.52	41.95	58.05	27.82	2.05
13-14	88.02	11.98	3.10	2.53	.36	5.31	6.99	.37	.54	41.95	58.05	29.16	1.90
14-15	88.02	11.98	3.16	2.55	.36	5.23	6.95	.28	.53	41.25	58.75	29.26	2.15
15-16	..	..	..	..	..	..	..	..	..	..	..	..	..
16-17	88.20	11.80	3.06	2.37	.31	5.38	6.92	.31	.55	41.80	58.20	29.02	2.10
17-18	88.02	11.98	3.12	2.38	.33	5.49	6.97	.38	.55	42.50	57.50	28.60	2.00
18-19	88.32	11.68	2.79	2.29	.33	5.55	6.96	.28	.56	40.15	59.85	29.00	2.05
19-20	88.02	11.98	3.10	2.35	.33	5.52	6.80	.35	.56	39.30	60.70	30.63	2.05
20-21	88.20	11.80	3.12	2.38	.35	5.27	6.91	.42	.53	38.30	61.70	29.97	2.30
21-22	88.12	11.88	3.18	2.46	.32	5.24	6.86	.35	.53	40.25	59.75	29.56	2.30
22-23	..	..	..	..	..	..	..	..	..	..	..	..	..
23-24	88.16	11.84	3.19	2.19	.32	5.44	6.87	.37	.55	39.90	60.10	30.16	2.25
24-25	87.86	12.14	3.23	2.43	.32	5.46	6.99	.26	.55	42.25	57.75	29.28	2.20
25-26	88.12	11.88	3.22	2.42	.36	5.18	6.94	.38	.57	33.50	66.50	33.78	2.55
26-27	87.94	12.06	3.22	2.48	.35	5.29	6.78	.29	.57	40.25	59.75	29.82	2.30
27-28	87.98	12.02	2.98	2.49	.33	5.52	6.93	.36	.53	40.25	59.75	28.74	2.30
28-29	88.02	11.98	3.25	2.56	.36	5.13	6.75	.31	.56	40.55	59.45	27.86	2.45
29-30	88.02	11.98	3.14	2.55	.39	5.20	6.81	.30	.54	41.55	58.45	28.18	2.25
Average	88.11	11.89	3.09	2.43	.33	5.35	6.89	.37	.55	40.81	59.19	29.43	2.15

## RECORD OF OBSERVATIONS MADE AT THE BATH AND

1	2	3	4	5	6	7	8	9	10
RELATING TO EVENING'S MILK.									
No. of cwt.	Name of Field.	Volume of Milk.	At Night.				In Morning.		
			Time.	Temp. of Dairy.	Temp. of Milk.	Acidity.	Temp. of Dairy.	Temp. of Milk.	Ac.
		galls.	P.M.				min.	max.	
-1	{Thirty acres, Common Mead . . . . .}	56	5.5	61	84	·18	59	62	64
-2	Thirty acres, Duck Pool . . . . .	60	6.20	64	88	·18	58	67	66
-3	Ditto . . . . .	64	6.20	61	84	·19	67	60	62
-4	Ditto . . . . .	64	6.10	65	89	·18	59	64	68
-5	The Commons, Duck Pool . . . . .	63	6.7	67	90	·18	60	67	69
-6	Ditto . . . . .	67	6.14	70	91	·19	60	70	68
-7									
-8	Ditto . . . . .	62	5.30	65	87	·19	58	65	64
-9	Ditto . . . . .	68	6.20	65	87	·18	60	65	67
-10	Ditto . . . . .	66	6.35	67	88	·18	60	67	68
-11	Ditto . . . . .	74	7.45	67	88	·19	60	67	68
-12	Ditto . . . . .	73	6.30	68	89	·19	58	68	68
-13	Ditto . . . . .	80	6.35	67	86	·19	61	67	70
-14									
-15	Ditto . . . . .	69	5.15	72	88	·20	65	72	71
-16	Ditto . . . . .	74	6.38	69	89	·18	65	69	72
-17	Ditto . . . . .	70	6.15	67	89	·18	64	67	71
-18	{Thirty Acres, Hyatt's Common . . . . .}	76	6.30	67	86	·18	61	64	70
-19	Ditto . . . . .	77	6.35	64	85	·18	61	64	70
-20	Ditto . . . . .	75	6.20	65	85	·19	62	65	70
-21									
-22	Ditto . . . . .	70	5.10	66	87	·18	59	..	65
-23	Ditto . . . . .	76	7.50	65	83	·17	61	..	68
-24	Ditto . . . . .	77	6.35	64	89	·19	61	65	70
-25	Ditto . . . . .	79	6.45	64	85	·18	60	64	69
-26	Ditto . . . . .	72	6.15	66	84	·18	61	66	68
-27	Ditto . . . . .	76	6.30	67	88	·19	61	67	69
-28									
-29	{Common Hyatt's Com- mon . . . . .}	66	5.5	71	89	·19	64	72	68
-30	Ditto . . . . .	76	6.25	68	89	·18	64	71	71
-31	Ditto . . . . .	75	6.30	66	87	·18	61	66	69
-32									
-33		70½	..	66	87	·18	61	66	68

TEST OF ENGLAND SOCIETY'S CHEESE SCHOOL, MAY, 1893.

12	13	14	15	16	17	18	19	20	21	22	23
MORNING'S MILK.				MILK HEATED.		STALE WHEY.		MIXED MILKS, &c.			
Name of Field.	Vol. of Milk.	Acidity.	Total Vol. of Milk.	Quantity.	To Temp.	Quantity.	Acidity.	Acidity before Ren-netting.	Time of Ren-netting.	Bennet added.	
										Vol.	Proportion.
	galls.		galls.	galls.		galls.			A.M.	ounces.	
hirty acres, Com- mon Mead	75	·19	131	39	90	none	..	·19	7.34	2·36	8881
hirty acres, Duck Pool	72	·19	132	47	84	2½	·18	·19	7.25	2·38	8874
itto . . . . .	73	·18	137	47	88	2	·40	·19	7.35	2·49	8803
itto . . . . .	69	·20	133	45	88	2	·41	·19	7.23	2·36	9020
he Commons, Duck Pool	72	·19	135	45	83	2	·45	·20	7.22	2·40	9000
itto . . . . .	73	·19	140	44	88	2	·41	·19	7.30	2·48	9032
itto . . . . .	79	·19	141	44	90	2	·38	·19	7.23	2·50	9024
itto . . . . .	75	·18	143	49	90	2	·39	·19	7.26	2·54	9008
itto . . . . .	73	·18	139	47	88	2	·40	·20	7.26	2·46	9040
itto . . . . .	81	·19	155	50	85	1	·44	·19	7.23	2·75	9018
itto . . . . .	74	·19	147	50	90	2	·41	·19	6.40	2·61	9011
itto . . . . .	83	·18	163	52	84	1	·42	·19	7.35	2·89	9024
itto . . . . .	87	·18	156	34	80	1	·31	..	7.20	2·77	9011
itto . . . . .	78	·19	152	29	88	1	·41	·19	7.38	2·70	9007
itto . . . . .	87	·18	153	37	90	1	·46	·19	7.36	2·72	9000
irty Acres, Hy- tt's Common	83	·18	159	40	90	1½	·40	·19	7.30	2·82	9021
itto . . . . .	85	·20	162	44	88	2	·39	·19	7.44	2·88	9000
itto . . . . .	85	·19	160	42	88	2	·35	·19	7.18	2·85	8982
itto . . . . .	90	·18	160	41	85	3	·29	·20	7.29	2·84	9014
itto . . . . .	83	·19	159	41	90	1	·43	·19	7.30	2·82	9021
itto . . . . .	83	·19	160	43	90	1	·45	·20	7.52	2·84	9014
itto . . . . .	82	·20	161	41	88	1	·45	·20	7.11	2·86	9007
itto . . . . .	91	·19	163	36	84	1	·44	·19	7.30	2·89	9024
itto . . . . .	81	·18	157	30	90	1	·43	·20	7.20	2·79	9004
itto . . . . .	90	·19	156	29	85	1	·45	·20	7.18	2·77	9011
itto . . . . .	81	·18	157	39	90	1	·40	·20	7.52	2·79	9004
itto . . . . .	81	·18	156	40	87	1	·42	·20	7.25	2·77	9011
	80	·19	151	..	..	..	·40	·19	7.26	2	

## RECORD OF OBSERVATIONS MADE AT THE BATH AND

	24	25	26	27	28	29	30	31	32	33	34	34a	35
y of nth.	Time when Curd cut.	Acidity of Whey before Break- ing.	Time of Break- ing.	Acidity of Whey put aside.	Time Scalding com- mences.	Temp. of Scald.		Time taken in Stir- ring.	Time in Scald.	RELATIVE TO WHEY.			
						1st.	2nd.			Temp. when drawn.	Acidity.	Volume.	Acidity of drainings from piled Curd.
	A.M.		A.M.		A.M.			min.	h. m.			galls.	
-1	8.35	·12	8.50	·13	9.50	88	92	60	2 0	88	·12	122	·13
-2	8.22	·12	8.43	·12	9.45	88	92	40	1 40	88	·15	124	·18
-3	8.18	·13	8.35	·13	9.35	88	92	30	1 20	90	·15	127	·17
-4	8.18	·12	8.35	·14	9.43	88	92	30	1 17	89	·17	117	·20
-5	8.15	·13	8.32	·14	9.29	88	92	30	1 33	90	·15	127	·17
-6	8.30	·13	8.45	·13	9.22	88	92	30	1 43	89	·15	132	·19
-7													
-8	8.16	·13	8.38	·14	9.45	88	92	30	1 43	89	·18	135	·25
-9	8.22	·12	8.43	·13	9.45	88	92	30	1 20	89	·15	132	·18
-10	8.13	·14	8.27	·14	9.24	88	92	20	1 23	90	·20	131	·35
-11	8.13	·12	8.35	·13	9.50	88	92	27	1 27	89	·15	146	·20
-12	7.26	·12	7.38	·13	8.35	88	92	35	1 23	89	·14	138	·16
-13	8.25	·12	8.47	·12	10.5	88	92	30	1 20	89	·15	153	·17
-14													
-15	8.10	·12	8.30	·12	9.35	88	92	30	1 42	89	·13	147	·18
-16	8.25	·14	8.38	·15	9.40	88	92	10	0 48	90	·22	143	·33
-17	8.30	·12	8.52	·13	9.50	88	92	40	1 45	88	·14	143	·18
-18	8.25	·13	8.45	·13	9.47	88	92	43	1 40	89	·14	152	·18
-19	8.35	·12	9.3	·13	10.5	88	92	47	1 50	89	·14	153	·16
-20	8.16	·12	8.43	13	10.4	88	92	30	1 34	89	·17	153	·25
21													
22	8.29	·12	8.51	·12	9.51	88	92	30	1 34	90	·15	153	·25
23	8.30	·13	8.50	·14	9.59	88	92	30	1 16	90	·17	150	·26
24	8.52	·12	9.10	·13	10.5	88	92	40	1 39	88	·20	152	·23
25	8.6	·13	8.24	·13	9.37	88	92	40	1 37	90	·17	152	·23
26	8.30	·12	8.50	·12	10.5	88	92	30	1 50	90	·21	150	·28
27	8.12	·13	8.35	·13	9.40	88	92	37	1 39	89	·19	147	·26
28													
29	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
30	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
31	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
32													
33	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
34	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
35	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
36													
37	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
38	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
39	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
40													
41	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
42	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
43	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
44													
45	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
46	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
47	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
48													
49	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
50	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
51	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
52													
53	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
54	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
55	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
56													
57	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
58	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
59	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
60													
61	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
62	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
63	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
64													
65	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
66	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
67	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
68													
69	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
70	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
71	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
72													
73	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
74	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
75	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
76													
77	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
78	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
79	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
80													
81	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
82	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
83	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
84													
85	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
86	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
87	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
88													
89	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
90	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
91	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
92													
93	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
94	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
95	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
96													
97	8.2	·12	8.25	·12	9.25	88	92	45	1 35	90	·16	147	·21
98	8.40	·12	9.0	·14	9.55	88	92	30	1 35	90	·20	150	·29
99	8.12	·14	8.33	·16	9.30	88	92	15	1 20	90	·29	148	·41
100													

TEST OF ENGLAND SOCIETY'S CHEESE SCHOOL, MAY, 1893—*cont*

36	37	38	39	40	41	42	43	44	45	46	47	48	49	
Time Curd remains milled.	Time Curd was taken from Tub.	Temp- of Curd when taken from Tub.	ACIDITY OF WHEY DURING TREATMENT OF CURD.								Acidity of Curd when Milled.	SALT ADDED.		Tem- per- ature
			When taken to Cooler.	After 1st Cut- ting.	After 2nd Cut- ting.	After 1st Turn- ing.	After 2nd Turn- ing.	After 3rd Turn- ing.	After 4th Turn- ing.	Weight.		Per- centage.		
min.											lbs. oz.		min.	
40	1.0	86	·13	·14	·18	·23	·34	·69	..	2·00	2 11	2·07	58	
45	12.45	89	·27	·40	..	..	..	..	..	2·20	2 12	2·02	61	
30	11.55	90	·26	·38	·59	·80	·92	..	..	2·20	2 14	2·08	61	
30	12.0	90	·32	·47	·72	·92	..	..	..	2·40	2 13	2·09	62	
35	12.5	90	·27	·38	·57	·69	·83	..	..	2·00	2 13	2·08	65	
40	12.15	90	·30	·47	·69	·90	1·02	..	..	2·80	3 0	2·12	63	
18	12.15	90	·40	·64	·92	1·03	..	..	..	2·80	3 0	2·07	62	
30	12.15	90	·29	·43	·65	·86	·98	..	..	2·30	3 0	2·02	62	
15	11.28	91	·53	·75	·92	1·05	..	..	..	2·60	2 14	1·90	64	
30	12.22	89	·32	·46	·71	·93	1·07	..	..	2·40	3 5	2·10	63	
45	11.15	89	·29	·36	·50	·65	·82	·90	..	2·20	3 2	2·05	62	
30	12.27	89	·27	·40	·57	·75	·93	..	..	2·80	3 8	2·09	65	
30	12.22	89	·28	·41	·60	·75	·84	..	..	3·00	3 5	2·09	66	
5	10.58	90	·45	·60	·77	·90	..	..	..	2·80	3 5	2·07	66	
33	12.45	89	·29	·41	·64	·78	·96	..	..	2 20	3 5	2·18	67	
38	12.40	90	·26	·37	·55	·71	·85	1·01	..	2·20	3 7	2·04	63	
45	1.20	88	·25	·36	·48	·59	·73	·88	..	2·40	3 8	2·08	62	
35	12.40	90	·38	·50	·73	·90	..	..	..	4·00	3 7	2·03	63	
25	12.25	91	·48	·74	·97	..	..	..	..	3·50	3 8	2·03	67	
12	12.7	90	·39	·58	·78	·91	..	..	..	3·40	3 7	2·06	67	
30	12.45	91	·47	·65	·87	·97	..	..	..	2·80	3 6	2·02	62	
30	12.30	90	·45	·63	·78	·91	..	..	..	3·00	3 6	2·01	62	
30	1.5	90	·46	·55	·68	·77	·98	..	..	3·40	3 7	2·09	65	
30	12.30	89	·42	·54	·71	·85	·97	..	..	3·00	3 6	2·08	64	
45	12.15	90	·42	·58	·77	·92	1·01	..	..	2·60	3 5	2·03	65	
13	12.17	89	·41	·56	·76	·85	·97	..	..	3·20	3 5	2·04	64	
7	11.29	89	·50	·64	·73	·85	..	..	..	2·80	3 8	2·16	64	
..	12.14	89	..	..	..	..	..	..	..	2·70	3 2	2·06	63	

## RECORD OF OBSERVATIONS, MAY, 1893—continued.

	50	51	52	53	54	55	56	57	58	59	60				
r of sth.	RELATING TO CURD.			RELATING TO CHEESES.										Weight of Cheese when sold.	
	Temp. in Vat.	Weight when Vatted.	Time of Vatting.	Acidity of Liquid from Press.	Weight taken to Cheese Room.	Loss in Press.	Temp. of Cheese Room.				Hygrometer Reading.				
							Morning.		Evening.		Morning.		Evening.		
							Min.	Max.	Min.	Max.	Wet.	Dry.	Wet.		Dry.
1	67	lbs. 129½	A.M. 7.0	per cent. 1.09	lbs. 121½	lbs. 8	62	65	62	64	60	64	61	64	lbs. 112½
2	76	136	P.M. 4.40	1.01	124½	11½	61	63	62	63	62	65	61	63	116½
3	76	138	4.5	1.02	127½	10½	61	62	61	64	59	62	61	65	118½
4	76	134	3.15	.99	123	11	62	64	62	64	60	63	62	66	116
5	78	135	4.0	1.00	125½	9½	63	65	63	66	61	65	63	67	118
6	76	141	4.35	1.11	129	12	64	67	64	66	61	65	62	67	120
7															
8	78	145	3.35	1.10	134	11	63	66	63	65	60	64	62	66	125
9	77	148½	4.20	1.07	137	11½	64	65	64	66	61	65	64	67	128
10	80	151	1.57	1.10	134½	16½	64	66	64	67	63	66	68	68	123
11	78	157½	4.35	1.08	142½	15	64	66	64	67	61	65	63	68	131½
12	76	152	3.40	1.00	141½	10½	64	67	64	69	61	66	64	69	130½
13	80	167	4.50	1.02	151	16	66	68	66	69	63	67	65	70	141
14															
15	81	158	4.55	.95	141½	16½	67	69	68	71	65	69	66	71	131½
16	82	159½	12.55	.97	143	16½	68	70	68	70	66	70	66	70	129
17	76	152	5.0	.96	137½	14½	67	69	67	72	65	69	67	70	128
18	75	168½	5.40	1.03	147½	20	66	68	66	68	64	67	64	67	138
19	75	168	7.50	.97	152	16	64	66	64	65	62	66	63	66	142½
20	75	169½	4.28	1.01	147	22½	63	65	60	64	62	65	64	64	137
21															
22	76	172½	3.30	1.12	150½	22	60	64	60	64	64	64	62	65	139
23	77	166½	3.55	.97	149½	17	62	62	60	64	60	63	62	65	139½
24	76	167	3.55	1.02	150½	16½	62	64	62	64	61	64	62	65	141
25	76	165	4.12	.98	150½	14½	62	64	63	65	61	64	63	66	140
26	76	164½	5.30	1.01	151½	13	63	65	64	66	62	65	64	67	143
27	75	162	5.30	1.02	152	10	64	66	64	66	62	65	64	67	142
28															
29	79	162½	4.15	1.07	149	13½	64	67	66	68	64	67	66	69	138
30	76	162	4.35	1.00	152	10	66	68	66	67	65	68	65	68	141½
31	75	162	2.10	.97	151	11	66	67	64	66	64	67	64	67	136
..	76	155	4.57	1.02	141	14	64	66	64	66	62	65	64	67	131

Day of Month.	COMPOSITION OF MILK.						COMPOSITION OF WHEY.			COMPOSITION OF CURD.				
	Water.	Solids.	Fat.	Casein.	Albumin.	Sugar.	Ash.	Solids.	Fat.	Ash.	Water.	Solids.	Fat.	Ash.
30-1	88.06	11.94	3.10	2.48	.37	5.31	.68	6.89	.36	.53	41.20	58.80	30.11	2.30
1-2	87.96	12.04	3.09	2.55	.34	5.36	.70	6.92	.27	.52	41.80	58.20	28.95	2.35
2-3	88.24	11.76	3.09	2.59	.34	5.06	.68	6.90	.33	.54	41.00	59.00	26.55	2.50
3-4	88.18	11.82	2.86	2.62	.36	5.26	.72	6.95	.36	.53	41.35	58.65	27.44	2.35
4-5	88.12	11.88	2.86	2.62	.36	5.32	.72	6.95	.34	.52	41.85	58.15	28.70	2.35
5-6	88.06	11.94	2.85	2.66	.37	5.36	.70	6.91	.34	.52	41.00	59.00	27.78	2.50
6-7	87.88	12.12	3.02	2.61	.38	5.41	.70	6.96	.33	.54	41.85	58.15	27.64	2.30
7-8	87.84	12.16	3.15	2.62	.40	5.31	.68	6.92	.36	.52	41.60	58.40	26.60	2.30
8-9	88.00	12.00	3.07	2.59	.43	5.19	.72	6.93	.41	.52	41.25	58.75	28.88	2.20
9-10	88.04	11.96	2.98	2.64	.38	5.28	.68	6.94	.17	.54	40.85	59.15	26.95	2.25
10-11	87.84	12.16	3.10	2.68	.37	5.31	.70	6.83	.37	.52	40.15	59.85	29.28	2.30
11-12	87.84	12.16	3.03	2.59	.35	5.37	.68	6.89	.28	.53	41.05	58.95	26.21	2.20
12-13	87.98	12.02	3.03	2.59	.35	5.37	.68	6.89	.28	.53	41.05	58.95	26.21	2.20
13-14	88.10	11.90	2.97	2.62	.38	5.25	.68	6.83	.30	.55	41.40	58.60	28.18	2.25
14-15	88.00	12.00	3.01	2.54	.35	5.44	.66	6.99	.30	.54	42.20	57.80	27.21	2.30
15-16	88.22	11.78	2.85	2.53	.35	5.37	.68	6.92	.36	.51	40.95	59.05	27.86	2.30
16-17	87.88	12.12	3.21	2.49	.39	5.29	.74	6.87	.34	.54	41.65	58.35	27.08	2.35
17-18	87.80	12.20	3.28	2.65	.40	5.13	.74	6.84	.32	.53	40.45	59.55	28.87	2.35
18-19	87.80	12.20	3.28	2.65	.40	5.13	.74	6.84	.32	.53	40.45	59.55	28.87	2.35
19-20	87.72	12.28	3.25	2.58	.38	5.43	.64	6.78	.22	.54	41.75	58.25	27.84	2.25
20-21	87.92	12.08	3.05	2.63	.38	5.38	.64	6.88	.38	.54	42.25	57.75	28.35	2.30
21-22	87.90	12.10	3.20	2.65	.40	5.17	.68	6.69	.38	.53	40.55	59.45	29.09	2.30
22-23	87.86	12.14	3.13	2.60	.39	5.36	.66	6.82	.35	.52	41.00	58.40	28.44	2.25
23-24	88.00	12.00	3.07	2.64	.38	5.27	.64	6.72	.36	.53	40.80	59.20	28.46	2.25
24-25	88.08	11.92	3.01	2.59	.36	5.36	.60	6.80	.37	.54	41.00	59.00	28.64	2.20
25-26	88.10	11.90	2.99	2.56	.36	5.31	.68	6.84	.40	.54	40.35	59.65	30.24	2.20
26-27	87.98	12.02	3.03	2.57	.36	5.40	.66	6.79	.37	.54	40.85	59.15	29.58	2.25
27-28	88.00	12.00	3.07	2.52	.39	5.34	.68	6.71	.37	.55	40.75	59.25	29.78	2.20
28-29	87.88	12.12	3.11	2.48	.38	5.49	.66	6.81	.42	.56	41.60	58.40	29.14	2.30
29-30	87.88	12.12	3.05	2.59	.37	5.32	.68	6.86	.33	.53	41.23	58.77	28.29	2.20
30-31	87.99	12.01	3.05	2.59	.37	5.32	.68	6.86	.33	.53	41.23	58.77	28.29	2.20
Average														



## RECORD OF OBSERVATIONS MADE AT THE BATH AND

1	2	3	4	5	6	7	9	10	11
RELATING TO EVENING'S MILK.									
7 of nth.	Name of Fields.	Volume of Milk.	At Night.			In Morning.			Acidity.
			Time.	Temp. of Dairy.	Temp. of Milk.	Acidity.	Temp. of Dairy.	Temp. of Milk.	
		galls.	p.m.				min.	max.	
JUNE.									
5	(Commons:— Hyatt's Common . . . . .)	68	5.10	68	86	·18	66	69	68 ·19
6	Ditto . . . . .	73	6.20	68	87	·18	64	68	70 ·19
7	Ditto . . . . .	70	6.25	69	88	·18	64	69	70 ·20
8	Ditto . . . . .	69	6.10	71	92	·19	62	71	70 ·20
9	Ditto . . . . .	73	6.20	71	90	·18	63	71	71 ·19
10	Ditto . . . . .	73	6.25	71	90	·18	64	71	71 ·19
	Average . . . . .	71	..	69	89	·18	64	70	70 ·19
JULY.									
3	Clapp's Corner, Mixed . . . . .	57	5.10	75	91	·18	69	75	72 ·21
4	Ditto . . . . .	61	6.15	77	93	·18	67	76	72 ·18
5	Thirty Acres, Mixed . . . . .	64	6.20	72	90	·18	67	72	70 ·18
6	Ditto . . . . .	63	6.10	71	88	·17	66	73	71 ·19
7	Ditto . . . . .	60	6.20	74	89	·18	67	76	73 ·19
8	Clapp's Corner . . . . .	63	6.15	76	92	·18	69	78	74 ·18
	Average . . . . .	61	..	74	90	·18	67	75	72 ·19
AUGUST.									
7	(Common Mead, Inside) Commons . . . . .	64	5.15	66	86	·19	65	66	70 ·21
8	Ditto . . . . .	70	6.30	71	92	·19	65	72	72 ·20
9	Ditto . . . . .	69	6.25	72	93	·19	66	74	73 ·20
10	Ditto . . . . .	67	6.50	77	90	·18	69	78	74 ·20
11	Middle Commons . . . . .	69	6.55	71	89	·19	69	74	74 ·20
12	Ditto . . . . .	68	6.55	73	88	·19	69	74	74 ·20
	Average . . . . .	68	..	71	89	·19	67	73	73 ·20
SEPTEMBER.									
	(Thirty Acres, Hyatt's) Common . . . . .	48	5.55	70	88	·19	63	71	67 ·19
	Ditto . . . . .	53	6.45	69	87	·18	62	72	68 ·19
	Ditto . . . . .	52	7.0	70	88	·18	62	73	66 ·19
	Ditto . . . . .	50	6.35	71	87	·18	66	71	71 ·19
	Ditto . . . . .	52	6.40	70	88	·18	64	72	67 ·19
	Ditto . . . . .	51	6.30	68	86	·18	64	70	67 ·19
	Average . . . . .	51	..	70	87	·18	63	71	68 ·19

## OF ENGLAND SOCIETY'S CHEESE SCHOOL, 1893.

12	13	14	15	16	17	18	19	20	21	22	23
MORNING'S MILK.			MILK HEATED.			STALE WHEY.		RELATING TO MIXED MILK, &c.			
Name of Fields.	Vol. of Milk.	Acidity.	Total Vol. of Milk.	Quantity.	Temp.	Vol.	Acidity.	Acidity before Ren-netting.	Time of Ren-netting.	Rennet Added.	
	galls.		galls.	galls.		galls.			A.M.	Vol. ounces.	Pro-portion
<b>JUNE.</b>											
sons:—	88	·18	156	32	90	1½	·36	·19	7.15	2·60	9600
att's Common	82	·17	155	34	90	none	..	·19	7.15	2·75	9018
.. . . .	78	·18	148	46	84	1	·39	·19	7.18	2·63	9000
.. . . .	75	·19	144	29	90	1	·42	·20	7.15	2·56	9000
.. . . .	77	·19	150	33	85	none	..	·19	7.5	2·66	9022
.. . . .	69	·18	142	42	90	1	·38	·19	7.50	2·52	9016
.. ..	78	·18	149	..	..	..	·39	·19	7.20	2·60	9109
<b>JULY.</b>											
p's Corner,	73	·18	130	37	82	1	·35	·21	7.26	2·36	8813
ixed Fields	62	·17	123	22	90	none	..	·18	7.1	2·23	8825
res, Mixed	68	·17	132	32	90	none	..	·18	7.22	2·40	8800
.. . . .	72	·18	135	26	86	none	..	·18	7.15	2·45	8816
.. . . .	73	·17	133	26	81	none	..	·18	7.32	2·41	8829
.. . . .	67	·17	130	26	83	none	..	·18	7.12	2·36	8813
.. ..	69	·17	130	..	..	..	..	·18	7.18	2·37	8816
<b>AUGUST.</b>											
mon Mead, In-	84	·18	148	36	84	none	..	·19	7.37	2·69	8803
le Common	77	·19	147	29	87	none	..	·20	7.35	2·67	8809
.. . . .	73	·19	142	33	84	none	..	·19	7.32	2·58	8806
.. . . .	71	·19	138	23	84	none	..	·20	7.38	2·50	8834
lle Commons	70	·18	139	28	82	none	..	·20	7.40	2·52	8825
.. . . .	76	·19	144	26	84	none	..	·20	7.44	2·61	8827
.. ..	75	·19	143	..	..	..	..	·20	7.38	2·59	8817
<b>SEPTEMBER.</b>											
ty Acres, Hy-	66	·19	114	27	87	1	·36	·19	7.39	2·07	8811
's Common	61	·18	111	34	90	1	·45	·19	7.52	2·07	8811
.. . . .	61	·18	113	41	90	1	·44	·19	7.53	2·05	8819
.. . . .	60	·18	110	28	88	1	·44	·20	7.50	2·00	8800
.. . . .	59	·18	111	36	90	1	·41	·18	7.47	2·01	8835
.. . . .	60	·18	111	39	90	1	·40	·19	7.44	2·01	8835
.. ..	61	·18	112	..	..	..	·42	·19	7.47	2·03	8818

## RECORD OF OBSERVATIONS MADE AT THE BATH A

	24	25	26	27	28	29	30	31	32	33	34	34a	3
Day of Month.	Time when Curd cut.	Acidity of Whey before breaking.	Time of breaking.	Acidity of Whey put aside.	Time Scalding commences.	Temp. of Scald.		Time taken in stirring.	Time in Scald.	RELATIVE TO WHEY.			
						1st	2nd			Temp. when drawn.	Acidity.	Volume.	Act of drain from p <sup>ts</sup> Cu
	A.M.		A.M.		A.M.			min.	h. m.				
JUNE.													
1-5	8.0	·12	8.20	·14	9.35	88	92	30	1 30	90	·23	145	·
1-6	8.0	·12	8.17	·12	9.5	88	92	30	1 25	91	·16	143	·
1-7	8.5	·12	8.25	·13	9.20	88	94	35	1 35	92	·19	142	·
1-8	8.3	·12	8.20	·14	9.23	88	94	15	1 12	92	·22	147	·
1-9	7.52	·12	8.20	·12	9.19	88	94	33	1 59	92	·15	142	·
1-10	8.35	·13	8.55	·	9.48	88	94	20	1 7	92	·21	135	·
Average ..		·12	·	·13	·	88	94	27	1 28	91	·19	141	·
JULY.													
2-3	8.10	·14	8.26	·14	9.20	89	94	45	1 35	92	·16	123	·
3-4	8.0	·11	8.26	·11	9.22	88	94	60	2 48	91	·16	117	·
1-5	8.22	·11	8.50	·11	9.40	88	94	60	2 10	91	·22	126	·
1-6	8.15	·11	8.42	·12	9.55	88	94	60	2 5	91	·16	127	·
1-7	8.33	·12	8.56	·12	9.50	88	95	30	1 30	93	·22	125	·
7-8	8.12	·11	8.35	·13	9.34	88	94	35	1 46	91	·21	122	·
Average ..		·12	·	·12	·	88	94	48	1 59	91	·19	123	·
AUGUST.													
1-7	8.27	·12	8.50	·13	9.46	88	94	37	1 40	92	·20	140	·
7-8	8.30	·12	8.55	·12	9.50	88	94	40	1 50	92	·18	137	·
1-9	8.26	·12	8.51	·13	9.40	88	94	37	1 35	92	·18	133	·
1-10	8.23	·13	8.47	·13	9.40	88	94	30	1 30	92	·20	132	·
1-11	8.38	·12	9.3	·12	9.55	88	94	60	1 57	91	·15	130	·
1-12	8.40	·12	9.4	·13	9.57	88	94	47	1 47	92	·19	132	·
Average ..		·12	·	·13	·	88	94	42	1 43	92	·18	134	·
SEPTEMBER.													
1-4	8.38	·12	9.0	·12	9.56	88	94	40	1 44	92	·15	106	·
1-5	8.39	·12	9.5	·13	9.40	88	94	35	1 45	92	·19	105	·
1-6	8.47	·11	9.17	·12	10.13	88	94	30	1 27	92	·17	106	·
1-7	8.50	·12	9.23	·12	10.15	88	94	35	1 30	92	·17	102	·
7-8	8.40	·12	9.9	·12	9.57	88	94	53	1 42	91	·18	103	·
1-9	8.40	·12	9.8	·12	10.0	88	94	53	1 48	91	·20	104	·
Average ..		·12	·	·12	·	88	94	41	1 39	92	·18	104	·

ST OF ENGLAND'S SOCIETY'S CHEESE SCHOOL, 1893—contd.

	37	38	39	40	41	42	43	44	45	46	47	48	49	
No. of Curd taken from tub.	Time taken from tub.	Temp. of Curd when taken from tub.	ACIDITY OF WHEY DURING TREATMENT.								SALT ADDED.		Temp. of Dairy.	
			When taken to Cooler.	After 1st cut- ting.	After 2nd cut- ting.	After 1st turn- ing.	After 2nd turn- ing.	After 3rd turn- ing.	After 4th turn- ing.	Acidity of Curd when milled.	Weight.	Per- centage.		
													lbs. oz.	min.
JUNE.														
5	11.55	94	·53	·57	·73	·88	·95	..	..	2·80	3 7	2·17	61	70
10	12.0	91	·35	·50	·65	·78	·85	·91	..	3·26	3 6	2·13	66	73
15	12.7	92	·53	·70	·87	·96	..	..	..	3·40	3 2	2·11	67	74
20	11.15	92	·49	·67	·84	·96	..	..	..	2·60	3 2	2·12	67	72
25	12.35	92	·32	·45	·59	·72	·82	·95	..	3·00	3 3	2·17	66	74
30	11.35	92	·48	·69	·82	·92	..	..	..	2·80	3 2	2·08	65	72
35	11.54	92	..	..	..	..	..	..	..	2·97	3 4	2·13	65	72
JULY.														
40	12.8	92	·24	·29	·36	·40	·54	·57	..	..	2 12	2·16	67	79
45	1.0	91	·31	·42	·59	·72	·80	..	..	..	2 9	2·13	69	77
50	12.25	91	·49	·66	·83	..	..	..	..	..	2 13	2·12	63	74
55	12.45	92	·40	·61	·74	·82	..	..	..	..	2 13	2·10	68	78
60	12.10	93	·48	·62	·80	·91	..	..	..	..	2 12	2·03	70	78
65	12.5	92	·50	·71	·92	..	..	..	..	..	2 12	1·99	71	77
70	12.25	92	..	..	..	..	..	..	..	..	2 12	2·09	68	77
AUGUST.														
75	12.20	91	·47	·64	·80	·87	..	..	..	..	3 5	2·15	66	74
80	12.33	93	·43	·57	·73	·80	·89	..	..	..	3 5	2·21	67	77
85	12.15	93	·50	·68	·81	·90	..	..	..	..	3 3	2·14	70	80
90	12.8	92	·48	·67	·80	·91	..	..	..	..	3 1	2·12	72	78
95	12.55	91	·35	·49	·67	·75	·75	·88	·92	..	3 1	2·11	71	76
100	12.40	93	·46	·65	·81	·91	..	..	..	..	3 3	2·12	71	77
105	12.28	92	..	..	..	..	..	..	..	..	3 3	2·14	69	77
SEPTEMBER.														
110	12.35	93	·44	·60	·79	·91	..	..	..	..	2 9	2·07	65	73
115	12.20	91	·46	·64	·79	·91	..	..	..	..	2 9	1·99	66	75
120	12.35	92	·35	·56	·75	·85	·88	..	..	..	2 8	2·01	61	75
125	12.45	93	·42	·57	·70	·80	·87	..	..	..	2 7	2·05	68	75
130	12.43	92	·40	·58	·71	·82	·85	·93	..	..	2 8	2·01	66	73
135	12.46	92	·46	·63	·78	·88	·94	..	..	..	2 8	2·01	64	72
140	12.37	92	..	..	..	..	..	..	..	..	2 8	2·02	65	74

## RECORD OF OBSERVATIONS, 1893—continued.

	50	51	52	53	54	55	56	57	58	59				
Day of Month.	RELATING TO CURD.			RELATING TO CHEESES.										
	Temp. in Vat.	Weight when Vatted.	Time of Vatting.	Acidity of Liquid from Press.	Weight taken to Cheese Room.	Loss in Press.	Temp. of Cheese Room.				Hygrometer.			
							Morning.		Evening.		Morning.		Evening.	
							Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
lbs.	P.M.	Per cent.	lbs.	lbs.										
JUNE.														
4-5	78	158½	2.20	.97	144½	14	63	66	64	66	63	66	63	66
5-6	78	158	5.10	.91	145½	12½	64	66	66	68	63	66	66	68
6-7	79	148	3.40	1.00	135½	12½	66	68	66	68	64	67	66	70
7-8	80	147½	2.0	1.09	134	13½	67	69	67	69	65	68	67	70
8-9	76	146½	7.5	1.07	134½	12	67	69	67	69	65	69	67	71
9-10	78	150	1.55	1.01	137½	12½	68	70	68	69	65	69	66	70
Average	78	151½	3.41	1.01	138½	13	66	68	66	68	64	67	66	68
JULY.														
2-3	78	127½	10.30	.80	117	10½	68	72	70	73	67	71	69	74
3-4	81	120½	4.45	.92	111½	9	68	73	67	69	65	70	65	68
4-5	80	132½	3.5	.95	124½	8	68	72	68	69	66	70	67	71
5-6	83	133½	3.50	.92	122½	11	67	69	67	69	65	69	67	70
6-7	83	135½	3.25	.86	129	6½	67	70	68	93	66	69	69	94
7-8	82	138	2.45	.91	128½	9½	69	73	69	71	68	71	68	71
Average	81	131	4.45	.89	122	9	68	71	68	74	66	70	67	71
AUGUST.														
6-7	81	154	3.40	.91	142	12	64	68	65	69	65	68	66	68
7-8	80	149½	4.45	.90	140½	9	66	68	66	69	65	68	66	68
8-9	83	149	3.40	.91	137	12	66	68	68	71	66	69	67	71
9-10	81	144½	3.5	.94	134½	10	69	71	69	71	67	71	66	70
10-11	80	145	6.18	.85	135½	9½	67	70	69	72	68	71	69	71
11-12	83	150	3.57	.87	137½	12½	69	71	68	72	68	71	68	71
Average	81	149	4.14	.90	138	11	67	69	67	71	66	70	67	71
SEPTEMBER.														
1	79	123½	3.43	1.00	112½	11	66	69	66	69	66	69	65	68
2	79	128½	3.40	.99	120	8½	66	68	67	69	64	68	65	68
3	78	124½	4.35	.91	115	9½	66	69	65	68	66	68	64	68
4	79	119	4.47	.89	110½	9½	67	70	64	68	66	69	64	68
5	77	124½	6.0	.93	114½	10	66	70	67	68	65	68	64	68
6	76	124½	4.40	.93	115	9½	65	67	65	67	64	67	64	68
Average	78	124	4.34	.94	114½	9½	66	69	66	68	65	68	64	68

## RECORD OF ANALYSES, 1893.

No.	COMPOSITION OF MILK.							COMPOSITION OF WHEY.			COMPOSITION OF CURD.			
	Water.	Solids.	Fat.	Casein.	Albumin.	Sugar.	Ash.	Solids.	Fat.	Ash.	Water.	Solids.	Fat.	Ash.
JUNE.														
87-76	12-24	3-25	2-36	36	5-61	66	6-74	27	53	41-90	58-10	28-92	2-20	
87-82	12-18	3-18	2-63	35	5-36	66	6-81	25	56	39-55	60-45	30-18	2-40	
88-16	11-84	3-00	2-90	36	4-98	60	6-66	32	54	39-60	60-40	29-92	2-40	
88-04	11-96	3-04	2-66	35	5-25	66	6-73	38	54	40-85	59-15	29-56	2-30	
88-18	11-84	2-83	2-64	35	5-34	68	6-79	34	57	39-60	60-40	29-70	2-25	
87-90	12-10	3-16	2-70	35	5-23	66	6-91	32	55	41-75	58-25	29-78	2-15	
87-97	12-03	3-08	2-65	35	5-30	65	6-77	31	55	40-54	59-46	29-68	2-28	
JULY.														
87-88	12-12	3-00	2-50	31	5-63	68	6-84	40	55					
88-00	12-00	3-15	2-48	34	5-37	66	6-64	35	56	38-50	61-50	30-80	2-60	
88-10	11-90	2-99	2-47	32	5-44	68	6-57	31	53	41-30	58-70	28-44	2-35	
87-68	12-32	3-44	2-61	34	5-23	70	6-63	41	55	39-70	60-30	30-92	2-45	
87-96	12-04	3-17	2-36	34	5-49	68	6-62	40	55	40-55	59-45	29-35	2-20	
87-56	12-44	3-48	2-53	36	5-41	66	6-79	42	56	41-15	58-85	29-94	2-30	
87-86	12-14	3-20	2-49	34	5-43	68	6-68	38	55	40-24	59-76	29-89	2-38	
AUGUST.														
87-94	12-06	3-12	2-63	35	5-30	66	6-59	39	54	40-80	59-20	28-91	2-25	
87-94	12-06	3-20	2-65	33	5-20	68	6-52	35	57	40-40	59-60	28-78	2-40	
87-76	12-24	3-25	2-84	35	5-14	66	6-62	34	54	41-40	58-60	29-00	2-30	
87-78	12-22	3-26	2-73	34	5-23	66	6-58	33	55	40-80	59-20	28-98	2-35	
87-80	12-20	3-20	2-90	33	5-09	68	6-52	37	54	41-10	58-90	28-50	2-30	
87-94	12-06	3-08	2-86	35	5-07	70	6-72	35	56	41-60	58-40	28-42	2-30	
87-86	12-14	3-19	2-77	34	5-17	67	6-59	35	55	41-02	58-98	28-76	2-32	
SEPTEMBER.														
87-36	12-64	3-69	2-99	34	4-94	68	6-73	38	55	40-80	59-20	29-07	2-30	
87-34	12-66	3-62	2-96	36	5-06	66	6-77	45	53	41-40	58-60	29-00	2-25	
87-60	12-40	3-41	2-97	38	4-98	66	6-69	36	56	41-25	58-75	28-32	2-35	
87-64	12-36	3-37	2-92	36	5-01	70	6-81	37	55	40-75	59-25	27-98	2-30	
87-84	12-66	3-62	2-98	36	5-02	68	6-76	39	54	40-60	59-40	29-07	2-35	
87-54	12-46	3-46	2-90	35	5-07	68	6-75	39	54	40-95	59-05	30-78	2-30	
87-47	12-53	3-53	2-95	36	5-01	68	6-75	39	54	40-96	59-04	29-04	2-31	

## RECORD OF OBSERVATIONS MADE AT THE BATH AND W

1	2	3	4	5	6	7	9	10	
RELATING TO EVENING'S MILK.									
Day of Month.	Name of Fields.	Volume of Milk.	At Night.				In Morning.		
			Time.	Temp. of Dairy.	Temp. of Milk.	Acidity.	Temp. of Dairy.	Temp. of Milk.	Ac.
		galls.	P.M.				min.	max.	
1-2	Common Mead, Horses	36	5.15	63	83	·18	57	63	63
2-3	Ditto . . . . .	37	6.20	63	85	·19	57	65	65
3-4	Ditto . . . . .	41	6.5	62	84	·18	57	63	64
4-5	Ditto . . . . .	40	6.15	60	85	·19	57	63	62
5-6*	Ditto . . . . .	38	6.22	62	83	·19	57	65	68
6-7	Ditto . . . . .	35	6.12	62	85	·19	57	60	66
Average .. .. .		38	..	62	84	·19	57	63	65

\* This was an Experimental Cheese, and in calculating the Averages, the figures relating are discarded.

	24	25	26	27	28	29	30	31	32	33	34	34a	
Day of Month.	Time when Curd cut.	Acidity of Whey before breaking.	Time of breaking.	Acidity of Whey put aside.	Time Scalding commences.	Temp. of Scald.		Time taken in stirring.	Time in Scald.	RELATING TO WHEY.			
						1st	2nd			Temp. when drawn.	Acidity.	Volume drawn.	Acidity.
	A.M.		A.M.		A.M.			min.	h. m.			galls.	
1-2	8.50	·12	9.15	·13	10 3	88	92	42	1 22	90	·21	82	
2-3	8.38	·12	9 5	·13	9.53	88	92	50	1 32	90	·21	74	
3-4	8.33	·12	9.5	·13	9 54	88	92	37	1 29	90	·22	78	
4-5	8.38	·13	9 2	·13	9.50	88	92	30	1 30	91	·21	76	
5-6	8.30	..	8.40	·12	9.56	96	106	30	0 56	102	·13	72	
6-7	8.31	·12	9.0	·12	9.51	88	92	30	1 29	92	·15	71	
Average	..	·12	..	·13	..	88	92	36	1 28	90	·20	75	

## OF ENGLAND SOCIETY'S CHEESE SCHOOL, OCTOBER, 1893.

12		13	14	15	16	17	18	19	20	21	22	23
MORNING'S MILK.				MILK HEATED.		STALE WHEY.		MIXED MILK, &c.				
Name of Field.		Vol. of Milk.	Acidity.	Total Vol. of Milk.	Quantity.	To Temp.	Vol.	Acidity.	Acidity before Renneting.	Time of Renneting.	Rennet Added	
											Vol.	Proportion by Volume.
Common	Mead.	galls.		galls.	galls.					A. M.	ounces.	
Horses		53	·20	89	33	89	2	·37	·20	7.55	1·61	884½
Ditto		44	·19	81	28	90	2	·39	·20	7.40	1·47	881½
Ditto		46	·19	87	35	85	2	·39	·20	7.43	1·58	881½
Ditto		43	·19	83	30	87	2	·40	·20	7.46	1·50	883½
Ditto		44	·20	82	35	87	none	..	·20	7.42	1·88	697½
Ditto		42	·19	77	32	84	2	·18	·20	7.43	1·40	880½
		45	·19	83	..	..	..	·35	·20	7.45	1·51	882½

36	37	38	39	40	41	42	43	44	45	46	47	48	49
Time Curd remains melted.	Time Curd was taken from Tub.	Temp. of Curd when taken from Tub.	ACIDITY OF WHEY DURING TREATMENT OF CURD.							Acidity of Curd when Milled.	SALT ADDED.		Temp. of Dairy.
			When taken to Cooler.	After 1st Cutting.	After 2nd Cutting.	After 1st Turning.	After 2nd Turning.	After 3rd Turning.	After 4th Turning.		Weight.	Percentage.	
min.	P. M.										lbs. oz.		min. max.
30	12.26	91	·47	·59	·77	·89	..	..	..	..	2 4	2·10	58 68
25	12.15	92	·48	·63	·78	·86	·93	1·03	..	..	2 2	2·05	59 66
28	12.15	91	·46	·58	·73	·84	·95	..	..	..	2 3	2·01	60 65
30	12.15	93	·48	·63	·72	·92	..	..	..	..	2 2	2·02	58 67
10	11.15	105	·15*	..	..	..	..	..	..	..	2 2	2·10	59 67
35	12.20	92	33	·52	·71	·86	·92	..	..	..	2 0	2·06	58 66
..	12.18	92	..	..	..	..	..	..	..	..	2 2	2·06	59 66



RECORD OF OBSERVATIONS, OCTOBER, 1893—*continued.*

	50	51	52	53	54	55	56	57	58	59					
Day of Month.	RELATING TO CURD.			RELATING TO CHEESES.								W. C.			
	Temp. in Vat.	Weight when Vatted.	Time of Vattng.	Acidity of Liquid from Press.	Weight taken to Cheese Room.	Loss in Press.	Temp. of Cheese Room.				Hygrometer Reading.				
							Morning.		Evening.		Morning.		Evening.		
							Min.	Max.	Min.	Max.	Min.		Max.	Min.	Max.
1-2	76	lbs. 107	P.M. 4.0	.90	lbs. 100	lbs. 7	59	63	59	62	59	62	58	61	
2-3	74	103½	4.45	1.01	98½	5	59	61	59	60	58	61	59	61	
3-4	74	108½	3.45	.97	101½	7	58	60	58	61	57	60	58	61	
4-5	77	105½	3.25	.93	99	6½	56	59	57	60	56	59	58	60	
5-6	71	101	8.30	.77	92	9	58	59	58	61	57	59	58	60	
6-7	73	97	4.10	.95	88½	8½	57	58	57	60	57	59	57	60	
average	74	104	4.1	.95	97	7	58	60	58	61	57	60	58	60	

## RECORD OF ANALYSES, OCTOBER, 1893.

Day of Month.	COMPOSITION OF MILK.					COMPOSITION OF WHEY.				COMPOSITION OF CURD.			
	Water.	Solids.	Fat.	Casein.	Albu- min.	Sugar.	Ash.	Solids.	Fat.	Ash.	Water.	Solids.	Fat.
	86·60	13·40	4·24	3·32	·51	4·65·68	6·64·43	·56	40·80	59·20	29·72		
	86·38	13·62	4·27	3·35	·46	4·88·66	6·73·44	·54	41·20	58·80	29·29		
	86·60	13·40	4·28	3·20	·43	4·81·68	6·62·43	·54	40·45	59·55	29·96		
	86·52	13·48	4·25	3·19	·45	4·91·68	6·85·47	·56	40·95	59·05	31·13		
	85·96	14·04	4·75	2·91	·46	5·26·66	6·93·52	·54	41·40	58·60	29·54		
	87·00	13·00	4·01	2·90	·43	5·00·66	6·82·39	·55	40·50	59·50	29·56		
	86·51	13·49	4·30	3·14	·46	4·92·67	6·76·45	·55	40·88	59·12	29·87		

As the composition of the preceding tables is necessary, the analysis being obtained in an exactly similar manner to that described in detail in previous Reports.

## THE RECORD OF ANALYSES OF MILK, &amp;c.

Last year, great difficulty was found, for many days during the season, in making the analysis of the milk; fortunately there was no difficulty this year, so that the records during the months of April and May are complete.

## ANALYSES OF THE CHEESES.

A very large number of analyses have been made of the cheeses when ready for sale, the results of which are given in the following table:—

## COMPOSITION OF CHEESES.

Made.	Sampled.	Water.	Fat.	Casein, &c.	Mineral Matter.
April 5 .. ..	July 17 .. ..	34.55	32.48	29.42	3.55
" 14 .. ..	" 17 .. ..	35.05	32.49	28.76	3.70
" 18 .. ..	" 17 .. ..	36.40	30.80	29.20	3.60
" 21 .. ..	" 17 .. ..	35.95	31.08	29.57	3.40
May 4 .. ..	August 15 ..	35.50	29.15	31.05	4.30
" 10 .. ..	" 15 .. ..	35.50	32.20	28.25	4.05
" 17 .. ..	" 15 .. ..	34.35	31.32	30.23	4.10
" 26 .. ..	" 15 .. ..	36.15	29.94	29.81	4.10
June 3 .. ..	September 17 ..	35.65	30.47	29.98	3.90
" 8 .. ..	" 17 .. ..	34.15	31.53	30.37	3.95
" 16 .. ..	" 17 .. ..	33.35	30.76	31.89	4.00
" 22 .. ..	" 17 .. ..	32.95	34.65	28.45	3.95
July 4 .. ..	September 17 ..	33.80	31.27	31.03	3.90
" 12 .. ..	" 17 .. ..	33.55	31.03	31.32	4.10
" 19 .. ..	" 17 .. ..	32.85	31.32	31.73	4.10
" 26 .. ..	" 17 .. ..	34.65	29.70	31.60	4.05
August 4 .. ..	November 17 ..	36.65	24.00	35.10	4.25
" 11 .. ..	" 17 .. ..	34.90	28.80	31.90	4.40
" 18 .. ..	" 17 .. ..	36.45	27.64	31.66	4.25
" 24 .. ..	" 17 .. ..	35.80	25.76	34.24	4.20
September 1A ..	November 29 ..	35.15	30.26	30.14	4.45
" 1B .. ..	" 29 .. ..	35.05	28.08	32.82	4.05
" 2 .. ..	" 29 .. ..	36.10	27.68	31.62	4.60
" 6 .. ..	" 29 .. ..	36.45	29.38	29.82	4.35
" 14 .. ..	" 22 .. ..	37.50	26.40	31.90	4.20
" 15 .. ..	" 29 .. ..	37.15	30.36	28.19	4.30
" 22 .. ..	" 29 .. ..	37.20	31.58	26.82	4.40
October 2 .. ..	December 28 ..	37.73	30.80	27.94	3.53
" 6 .. ..	" 28 .. ..	36.40	31.20	28.20	4.20
" 14 .. ..	" 28 .. ..	36.73	34.64	22.77	3.86
" 20 .. ..	" 28 .. ..	37.40	33.44	25.46	3.70

## III.—THE BACTERIOLOGICAL INVESTIGATION.

After writing my Report for the Journal last year, the Board of Agriculture asked me to furnish a special Report upon the bacteriological work done in connection with these experiments. This was published in the "Report on Grants to Agricultural and Dairy Schools, &c.," and those who are interested in this work should read that portion of the Report.

The work done this year has been most laborious, and it is to be regretted that it is not possible to set forth the results of such work in terms which can be easily understood by those who are not acquainted with bacteriology. I must therefore confine my remarks to a very simple statement of facts, and try and point out their practical bearing for the cheese-maker.

During April and May the milk showed no very special peculiarity, only those organisms being found in it which have been found on previous occasions. The cheeses were good, and no very special difficulty presented itself; but towards the end of May, the milk began to change, and the curd lost that sweetness which it had had before. From that time to the end of the season the curd produced was in no single instance of that quality and flavour which, for the most part, characterised the curd made at Vallis in 1891, and at Axbridge in 1892. One result of this has been most annoying. It prevented any experiment being made in which the milk should be inoculated with a pure culture of bacteria in order to see if similar results could be produced artificially as were produced naturally. The defects of the curd—for it is not until the curd is taken out of the tub that the presence of some taints is distinctly noticeable—may be stated to be three in number. First, as being the one which was almost constant, was a faecal smell, which, though very faint at first, became quite strong before the curd was vatted, and was so unpleasant on some occasions that it made one feel quite sick to be near the curd for any length of time.

When this peculiar smell was present, Miss Cannon informed me that it was most difficult to know whether the curd had attained sufficient acidity for grinding or not. The acidity apparatus was found of very great advantage in helping to determine this most important point. Miss Cannon takes so much interest in the observations that it was not possible to prevent her seeing the results obtained by the chemical test for acidity, and therefore it soon became evident to her that the best results were obtained when the acidity was high.

As illustrating the difficulty of judging the acidity when this taint was present, it may be mentioned that upon one such occa-

sion Mr. Cannon happened to visit the dairy. I asked him if in his opinion the curd was fit to grind. After examining it carefully, he said that it was; but, judging from the acidity test, it was not. However, I thought it would be a good experiment to have it ground then, and to try, when the cheese was ripe for sale, whether he was right or not. This cheese was made on the 25th June, and was tasted by Mr. Hill, Mr. Cannon himself, and Mr. Gibbons on the 17th September. The result was a very inferior cheese.

The second taint was one which I have met on a few previous occasions, and is similar to the smell of an out-of-the-way chemical compound 'aldehyde.' When present, the curd sours very rapidly, and requires to be closely attended to. Such was the cheese made on the 27th of April, which was put away at 2.6 P.M., although the average time of vatting for the month was 4.34 P.M.; it will also be noticed that though the acidity of the whey coming from the curd after second cutting was only 94 per cent., yet the acidity of the whey, or liquid, from press was 1.12, which is very high. On the 16th and 21st of May, similar rapid development of acidity took place; in the one instance the cheese being vatted at 12.55, and in the other at 2.10, although the average of the month was as late as 4.57.

The third taint was that which is well known to cheesemakers, and is the cause of a spongy curd. It was noticed upon several such occasions that the whey had during the night fermented to such an extent that in the morning it was all blistered and frothy. Upon examination under the microscope this whey cream was found to be teeming with bacteria.

Samples of milk, curd, and whey have been examined in dozens of instances when these taints were present, and the number of bacteria found and their variety have given me an enormous amount of work. It may be possible some day to present readers of this Journal with photographs of these bacteria, but at present it would be useless, for it has not yet been possible to prove which are the particular organisms that produce the mischief in each case. Indeed, it may take some years to prove this, for it will be necessary to preserve the various organisms, and to make cheese from milk into which each has been placed.

In the spongy curd alone no less than five distinct organisms have been found, and some idea of the work which has yet to be done may thus be obtained.

One organism in particular has been found so frequently that I am bound to consider that it has much to do with the condition of the milk. It is in every respect, so far as I have been able to make out, exactly similar in its appearance, and growth, and

in the various forms which it assumes to organisms previously described, but not in connection with the manufacture of cheese.

But the question of most practical importance is, whence do these bacteria come?

In all my former work, the organisms found in the milk have been chiefly impurities gathered from the air. In some instances where they have been of a special character I have been able to trace their source. And in other cases it has been proved that they have no hurtful influence upon the cheese. But every endeavour to trace certain of the organisms present this season has failed. Some I was able to trace; thus, one variety I felt sure was due to sores on the teats of the cows, and, upon examining the strainer over which the milk is passed before it enters the tub, I found a small scab therein, which upon careful microscopical examination was found to contain similar organisms. This trouble with the cows was frequent throughout the season, and invariably the same bacteria were found. They were chains of spherical organisms, and are known as streptococci. Another source of bacteria getting into milk were the flies; these at times were very troublesome. Many will get into the milk during the period of milking, more especially at certain times of the year, and particularly during a very dry and hot season such as the last. Probably milkers take very little heed whether the flies get into the milk or not; but I am certain that it is necessary to prevent this as much as possible. One knows how flies settle upon any dung in a field, they take some of this upon their bodies or feet, and carry it to the cows or any other article upon which they next settle. Now, having examined the bacteria in the dung of cows and horses, I find certain forms present which are not generally, and should not be, in milk. As I found one most characteristic of these in the milk on several occasions, I came to the conclusion that the cows were not being kept as clean as they should be. I inspected the cows, but did not find this supposition borne out by their appearance. The cows were well looked after. The conclusion that I finally arrived at was that the bacteria were carried to the milk by flies. Many investigations were made, and these proved, without doubt, that when flies were very numerous in the milk, bacteria were also numerous.

It has been mentioned, in the beginning of this Report, that the dairy was low and whitewashed. Now whitewash in very warm weather appears to attract flies, hence they were numerous in the dairy during the great heat of the summer, and during that period the milk was more tainted than later on. Again,

I noticed that the whey never fermented so badly as when there were large numbers of flies in it.\*

It is an accepted fact that milk as it comes from the cow is free from bacteria. Hence the bacteria which get into it before it enters the dairy must come—1st. From the air which it passes through in its passage to the pail. 2nd. From the pail itself. 3rd. From the hands of the milkers. Or 4th. From the teats of the cow. I have already referred to the possibilities of contamination from the teats. The pails were so carefully cleansed that in this instance I do not believe they were the means of introducing bacteria into the milk. One word as to the hands of the milkers. Probably care was taken, certainly careful instructions were frequently given as to the necessity of care in this respect. But man is but mortal, and in hot weather cider is refreshing. Now cider, especially old cider, is very full of bacteria, some of which have certainly been found in the milk, and always will be, if cider is drunk immediately before or during milking. The rapid souring of the curd previously referred to might be brought about by a little cider finding its way into the milk. For this rapid souring is accompanied with a smell more like that of acetic acid than of lactic acid.

Lastly, as to contaminations from the atmosphere, and this undoubtedly is the chief source of trouble. It is at the present day almost, if not quite, impossible to say what organisms can or cannot come from the atmosphere. Fortunately, being consulted by dairy farmers in all parts of the country, it soon came to my knowledge that the troubles which were being felt at the Cheese School were also being met with in other parts of the country. Thus, a cheese-maker in the Midlands sent a sample of milk giving trouble which I submitted to microscopical and bacteriological examination. In it were found exactly the same organisms as were giving so much trouble at the Cheese School, and which I associated throughout with the tainted curd, although as yet there has been no opportunity of proving the assumption correct. Similar results were obtained with milk received from Buckinghamshire, and also from Essex. Enquiries soon brought the information that fermenting curd, and a difficulty in making good cheese, was being found in many places, even by those who were making upon totally different systems. But upon enquiry I was informed that no such difficulty had been met with by the Cheddar Cheese-makers in the West of Scotland. It will be known to most of

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\* Referring to former Reports it has been mentioned that taints were most frequent in the past at about hay time. This is usually a time when flies are very troublesome, and that may account for the observed facts.

my readers that the season in the West of Scotland was entirely different to that of the West of England.

Now, if a tainted or peculiar condition of milk appears over a large district, or part of the country, and does not appear in another part, and the only difference that we can find between these localities is a climatic difference, are we not justified in assuming that this had something to do with the presence or absence of the taints in the milk? Though this may not be the only possible explanation, as we know little about the geographical distribution of bacteria.

But we have strong grounds in support of this reasoning if we may judge by analogy. It is a well-known fact that certain diseases are produced by bacteria, that these diseases will at times be prevalent over large areas, and for a certain time, while not present in other parts, and that they will disappear as suddenly as they came. We say that there is an epidemic of a disease. Is it not possible that there are epidemics of diseases or taints which affect milk, brought about by bacteria, just as there are epidemics of diseases among men? This, at least, is the only possible explanation which I can find that will satisfactorily account for the facts which have been very briefly stated in this Report. Even if further work may prove that it is not a tenable hypothesis, I cannot but think that it will be very serviceable as a working hypothesis for guidance in future investigations. It points, however, to the necessity for this research work being extended, and not confined to one part of the country only. Had it not been for what one may almost call mere accident, I should not have been aware of the prevalence of this trouble amongst cheese-makers generally.

With all these various troubles to contend against, the wonder is that Miss Cannon was able to make cheese of such good quality, and the question arises how was this brought about? A careful examination of very many of the cheeses has revealed the fact, that, of the organisms which caused the various taints, only a few varieties survived in the cheeses, and these only in some few of them. What is the explanation of this fact? It is the same as has been given before and emphasised by me in previous Reports, namely:—that sufficient acidity was produced in the curd before it was vatted to ensure the destruction of the invading organism. When the cheese was put up with too little acidity, the taint was more or less perceptible in the cheese. On the other hand, if too much acidity were produced, then the cheese, though it would not be a good one, was at least free from any taint. I shall have to refer to this subject again when speaking of the few experiments which were made during the year.

*The Cheeses.*—A very large number of cheeses have been most carefully examined in the manner described in my Report of last year. I shall now summarise the facts which have been obtained from this work and from preceding observations. The old theory was, that the ripening of cheese is brought about by the presence of certain bacteria known as the butyric acid bacillus, or *Bacillus Amylobacter*. To quote the words of no less an authority than De Bary, "the butyric acid fermentation is essential to the ripening of cheese." At least two organisms received this name. The organism which was considered the *Bacillus Amylobacter* by the earlier writers is, in my opinion, not this organism at all, but is one form of the *Oidium Lactis* referred to briefly in my Report for 1892. I have only found this organism in one single cheese, and never in a good one. I found it this year for the first time in a cheese which was of very inferior make, cracked, and suffering from the cheese fly. In this it was abundant; hence it is quite possible that it may be abundant in many of the foreign cheeses, which have hitherto been mainly the subject of investigation.

Prazmowski, however, has described a *Bacillus Amylobacter* which is entirely different to that of the older writers. And this organism I have found in very many of the cheeses, though not in all. It is seldom present in large numbers, and for one of the *Bacillus Amylobacter* there will be hundreds of other organisms present. It is, therefore, very evident that for cheese of the description made by Miss Cannon, which may be described as moderately quick ripening cheese, the *Bacillus Amylobacter* plays a very secondary part. What then are the bacteria present in such large numbers? I am not quite prepared to dogmatise upon this point, but the results hitherto obtained all point in one direction, namely, that it is the lactic acid bacillus. In a cheese examined soon after it is made, the bacilli are possessed of all the properties which characterise the *Bacillus Acidi Lactici* as obtained from milk, but in course of time they seem to lose these properties, as they grow under different conditions. Thus, if a minute portion of new cheese be placed in some sterile milk, the milk curdles within a couple of days. If we keep the cheese, and from time to time place a little in some sterile milk, it will be seen that the power of curdling the milk is slowly being lost. At last it seems to entirely disappear. Yet place some of this same cheese in some milk from which the air is excluded, and the milk will be curdled. Although for a long time it will be possible to obtain a growth of this lactic acid bacillus on gelatine, yet after a time even this is most difficult, and nothing will grow upon a plate culture. The long confinement of the organism apart from the atmosphere appears to change its



nature, and causes it to lose its most characteristic property. But the fact remains that it is this lactic acid ferment which has brought about whatever changes have taken place in the cheese, which we describe as "ripening" without exactly knowing what that ripening means.

The deductions which may be drawn from this work are important and conclusive. In the first place it is certain that for the manufacture of the best cheddar cheese, one and only one organism appears to be necessary, namely, the *Bacillus Acidi Lactici*: all other organisms are unnecessary, and some are detrimental. It is also certain that taints, fermentation, sponginess, a too rapid souring of the curd or a want of sufficient acidity, while generally promoted by careless manipulation, are all due either to the presence of injurious bacteria, or to the absence of those which are essential for the production of a good cheese. We know further that while, by careful manipulation, the *Bacillus Acidi Lactici* can be encouraged and its growth in sufficient quantity assured, on the other hand the presence of injurious bacteria can be to a large extent prevented by cleanliness. And lastly, while it is not possible to say at present whence come the injurious bacteria, which are occasionally found in milk, yet, by careful manipulation in the manufacture of the cheese, their evil influence may, to a large, extent be counteracted.

#### IV.—THE EXPERIMENTS AND EXPERIMENTAL CHEESES.

One of the difficulties which the cheese-maker has to contend against, especially in the spring of the year, is the low acidity of the milk, and the slow development of acidity in the process of cheese-making. I am convinced that, sooner or later, science will come to the aid of the cheese-maker in this respect, and my first experiment was directed to this end.

*1st Experiment.* 18th April.—One gallon of whey, the acidity of which was  $\cdot 35$  per cent., was added to the evening's milk at 6.15 P.M., the volume of milk being 52 gallons. The acidity of the remaining sour whey was next morning  $\cdot 42$  per cent. But the acidity of the milk, which in the evening was only  $\cdot 19$ , was in the morning  $\cdot 66$  per cent., hence the whole of it was a solid mass of curd. The rennet present in the whey may have had something to do with this result, but the main cause would undoubtedly be the high temperature of the milk, and, as a consequence, the much more rapid development of acidity. A number of experiments were subsequently made with small quantities of whey upon a definite quantity of milk kept at a constant temperature in the incubator. The results

are tabulated below, being first calculated to 1000 volumes of milk, so as to make them easier of comparison :—

**RESULTS of EXPERIMENTS on the RIPENING of MILK, by addition of WHEY taken from the tub after BREAKING the CURD.**

Volume of Milk.	Volume of Whey.	Temp. at which kept.	Milk curdled.	Acidity of the curdled Milk.
1000	10·0	75–85	Before 13 hours	per cent. ·64
"	5·0	"	"	·62
"	2·5	"	"	·57
"	10·0	67–77	After 15 and before 23 hours	·70
"	5·0	"	"	·70
"	2·5	"	"	·69
"	2·0	64–72	19 hours 20 min. after	·65
"	1·0	65–72	22 hours after	·65
"	·5	65–72	22 hours 50 min. after	·64

It will be very evident that the action of sour whey upon the milk is both powerful and uncertain. Therefore it is quite impracticable to use sour whey in the manner I had first thought possible, to raise the acidity of the evening's milk during the early and late months of the cheese-making season. The influence of temperature was also strongly shown in the results obtained. Thus, while 10 parts of whey per 1000 of milk caused the milk to curdle within 13 hours and to show ·64 per cent. of acid, at a temperature of from 75–85° Fahr., the same amount of whey in 1000 of milk kept at from 67–77° Fahr. produced only ·33 per cent. of acid in 13 hours.

We thus see the imperative necessity of keeping the milk and dairy warm at night, during cold weather, if we wish to ensure sufficient ripeness in the milk by the morning.

*2nd Experiment.*—This was made on the 30th April, the object being to see whether more rapid development of acidity could be obtained, and the value of the cheese enhanced, by adding the whey cream from the previous days' make to the milk in the warmer, so as to get it well mixed with the milk before renneting. The quantity of whey cream was  $\frac{1}{2}$  gallon. Very little difference was manifested during the making of the cheese, except that the whey had on its surface an oily appearance, and had a slightly strong smell. By reference to the tables, it will be seen that the addition of the whey cream prompted the souring of the curd; while the fat did not come out again in the whey but enriched the curd. The experiment will have to be repeated, and the value of the practice will have to be judged when the conditions are less favourable to the

development of acidity than they were last season. Meantime, where whey butter has but little sale or only at a low price, I think the practice of putting the whey cream back into the next day's milk may be advantageously practised, especially in the early months of the season.

*3rd Experiment.* 16th June.—For some time the difficulty of getting sufficient acidity in the curd had been very great, so that it was not vatted until late at night. This experiment was made to see if a better result could be obtained by keeping the curd in scald until as much acidity was present in the whey as was present in the milk before renneting.\* So slow was the development of acidity that the curd had to be stirred in scald for 1 hour 45 minutes. Even after that, the further development of acidity was very slow, and as I was determined to get the desired acidity, the cheese was not vatted until 10.10 P.M. But the result was worth all the trouble, for when the cheeses were sold this was declared to be "of good flavour and texture, and the best cheese of the month."

This result strongly confirms the conclusions set forth in the Reports for the past two seasons, conclusions which are supported by the results obtained this year, and of which the most important is, that a good cheese will result, even under most unfavourable conditions, provided sufficient acidity be obtained in the curd before it is vatted. It is because, by means of the test for acidity, this condition can be estimated with accuracy and certainty, that I have been able to produce experimental cheeses of good quality, although possessing very little skill in the practice of Cheddar cheese-making. If the use of the test for acidity were learned by young cheese-makers, and its valuable aid utilised in cases of difficulty, we should soon find a marked improvement in the cheese of the County of Somerset.

May I suggest that the use of this apparatus † might be taught in the schools of the county, in connection with the teaching of chemistry.

*4th and 5th Experiments.* 30th and 31st August.—The milk from Mr. Bethell's cows was kept separate from that of Mr. Hunt's each day, and cheeses were made,—one by Miss Cannon and one by myself,—in an exactly similar manner, in order to determine whether any difference existed between the two milk supplies.

The results were curious. Both the cheeses made on the 30th were poor and tainted, that from Mr. Hunt's milk being the worse. But both the cheeses made on the 31st were very good, that from Mr. Hunt's milk being if anything the better.

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\* The reasons for this course are fully stated in the Report for 1892.

† See 'Journal,' vol. iii. p. 179.

The fact that the milk supply to the School was from two sources has added considerably to the difficulty of finding out the origin of the taints. I most strongly urge the necessity in all future investigations of confining the source of milk supply to one farm only.

*6th Experiment.*—The milk on the 1st September was divided in half, Miss Cannon took one-half and made the cheese on her system, and I took the other half and made the cheese on Candy's system, so far as I then understood it. The point which I desired to test was this. In Candy's system the curd is exposed to the air while on the rack, but in Cannon's system it is kept encased in cloths, and with a weight on it. Now, would there be any difference in the two methods as regards the peculiar taint which the curd developed at this stage? The result was most interesting. When Miss Cannon's curd was vatted at 5 P.M. it had the foetid smell strongly developed, but was otherwise a good curd. In the curd made on Candy's system, the smell was perceptible but not nearly so strong. When the cheeses were cut for sale, no trace of the taint could be found in either, and Miss Cannon's cheese was the better of the two. The superiority of this cheese is easily accounted for, by the fact that cheeses made on Mr. Candy's system are not ready for market so soon as those made on Miss Cannon's system. Hence the cheese, though good, had not then the flavour which would be developed with longer ripening.

The *7th and 8th Experimental Cheeses* were made on 2nd and 14th September respectively, in order to determine some minor details. Upon these no comment is needed. The information yielded will be incorporated subsequently with that from other sources.

#### V.—OBSERVATIONS ON THE METHOD OF MAKING CHEDDAR CHEESE ADOPTED BY MR. T. C. CANDY.

In 1892 some experiments were made to try the effect of a high scald, and I determined this season to further study a system of Cheddar Cheese-making which depended upon a high scald. The best known of these is Candy's system. To make sure that I understood it, I wrote out a description and sent it to Mr. Candy, whom I have the pleasure of knowing. He returned it in due course, with the information that it was not a sufficiently accurate description of his system in some of the details, and that he thought it would be better for me to come to his place and study the system there. This I did on the 3rd, 4th, and 5th October. On the last day I made the cheese so far as possible myself, Mr. Candy watching me and pointing out and

correcting all errors in my manipulation. I have prevailed upon Mr. Candy to give the members of the Society the advantage of a full description of his method of cheese-making (see p. 127), which is, I believe, now published for the first time.

Mr. Candy informed me that, working from purely theoretical premises, I had, in making some of the experimental cheeses of 1892, very closely followed his system without being aware of it. The conclusions to which I came from those experiments were, that in Cannon's system the whey was pressed from the curd mainly by means of acidity, but that in Candy's system the whey would be expelled mainly by means of heat. I may here state that Mr. Candy, in order that I might see how his system was varied to meet different degrees of acidity or ripeness in the milk, was kind enough to take the trouble to obtain the milk each day in a different stage of ripeness. The following table shows the acidity developed in the various stages of manufacture at Mr. Candy's:—

TABLE OF ACIDITIES AT MR. CANDY'S.

	3rd Oct.	4th Oct.	5th Oct.
Mixed milk before renneting .. ..	·20	·205	·21
Whey before breaking .. ..	·12	·12	·13
Whey when drawn .. ..	·13	·13	·14
Draining from piled curd .. ..	·17	·15	·15
First drainings on cooler .. ..	·17	·16	·15
Second " " .. ..	·21	·19	·17
Third " " .. ..	·24	..	..
First draining after cutting .. ..	..	..	·22
Second " " .. ..	·33	·30	·31
Third and last draining after cutting	·33	·30	..
Liquid from press .. ..	·83	·92	..

If we compare the above figures with the acidities obtained on Cannon's system, it will be at once seen how very slow is the development of acidity in Candy's system.

There can be little doubt that we have here a complete confirmation of the deductions drawn in my last Report, namely, that while Cannon seeks to obtain the necessary dryness of the curd before grinding by means of acidity, Candy obtains that dryness by means of heat. Further, we obtain an insight, for the first time, into what may be considered the principle common to the two systems, namely, to obtain a curd before vatting which shall contain only a certain amount of whey, and that whey possessing a certain acidity.

Unfortunately, I was not able to make analyses of the various

products at Mr. Candy's, but I hope in the future an opportunity may be given me of studying his system more thoroughly.

I went direct from Mr. Candy's to the School at Butleigh, and there on the 6th October made a cheese upon his system. The results of the analyses, as well as the facts connected with that cheese, are given in the tables, and it will be seen that the amount of moisture in the curd was almost identical with that which Miss Cannon obtains in her curd. For some reason or another, the acidity did not develop in the curd before grinding so far as I could have wished, the acidity of the liquid from press being only  $\cdot 77$  per cent. Hence, when this cheese was tasted by Mr. Hill on the 28th December, he pronounced it "of good flavour, but not firm enough." But it is only right to state that Mr. Candy informed me cheese made upon his system required longer to ripen than three months, while this experimental cheese was not three months old when tasted. This statement of Mr. Candy's, which it may be taken for granted is based upon experience, is a confirmation of the opinion which I gave as the result of last year's work, namely, "that a cheese made with low acidity requires longer to ripen, and probably a higher temperature, than a cheese with high acidity."

An impression seems to have arisen, from my experiments at the Cheese School, that I am trying to determine the relative merits of Cannon's and Candy's systems. I have no such object. My aim, as a scientific observer, is to try and discover what laws of nature each utilises, and what results each obtains. At the same time I, naturally, compared the two methods and the results obtained therefrom. The conclusion I have come to is, that from the same milk as good a cheese can be made by the one method as by the other. And I have come to another conclusion,—one of far more importance to cheese-makers generally,—that makers who will not endeavour to understand the system they now adopt, and who do not bring cleanliness, forethought, experience, and skill to bear upon their work, will not be able to make a better cheese by the one system than by the other, and will never make excellent cheese by either.

## VI.—THE SCOURING LAND OF SOMERSET.

My attention was naturally drawn to these peculiar soils, which are well known, and form one of the remarkable features of Somerset. The scouring land appears to crop up here and there only, and runs in tracts mainly on the higher land, and far less frequently in the hollows. I have given no particular study to this land, but there are one or two points in connection there-

with which have an immediate bearing upon the cheese-making, hence my introducing the subject here.

My first attempt was, if possible, to see whether analyses would throw any light upon the cause of their action. Two samples of soil were obtained from typical scouring land, and analysed with the following results:—

#### ANALYSES OF SOILS (SCOURING LAND).

	Hutchings.	Bludgeley.
*Organic matter and loss on heating ..	14·40	17·65
Oxide of Iron .. .. .	10·02	9·55
Alumina .. .. .	6·83	6·93
Lime .. .. .	3·20	3·20
Magnesia .. .. .	1·20	1·00
Potash .. .. .	·60	·68
Soda .. .. .	·90	·10
Phosphoric acid .. .. .	·40	·42
Sulphuric acid .. .. .	·15	·10
Carbonic acid, &c. .. .. .	..	·42
Insoluble .. .. .	62·30	59·95
	100·00	100·00
*Containing nitrogen .. .. .	·55	·58
Equal to ammonia .. .. .	·66	·69

My first thought was that the amount of magnesia in the land might account for the herbage grown thereon having a scouring effect. But if we compare these analyses with the analyses made by Dr. Voelcker of the soils in the valley, we see that they are very similar; moreover, the amount of magnesia is not greater than that in the soils of the fields at Axbridge, nor even so great. They show only one peculiarity, an abnormally high percentage of nitrogen. Land containing a high proportion of nitrogen has a very rapid and forcing effect upon vegetation. But this high proportion of nitrogen is as difficult to account for as the scouring effect of the land; so we must leave this problem for the future, and merely point out that if any young chemist desires a good subject for research here is one.

Now, in 1891, I observed that the change of food, when the cows were first given cake, was productive of a taint in the milk. As is well known, a change of diet is productive of a certain amount of scouring, though it may only last a day or two. A similar effect was noted at Axbridge in 1892, and in 1893 it is universally stated by the cheese-makers that it is impossible to make good cheese off "scouring" land.

We may, perhaps, learn one simple lesson from these facts,

namely, that no matter where the cows may be, anything which causes them to scour will spoil or deteriorate the cheese. It will introduce fœcal organisms into the milk, and will cause a fœcal smell in the curd, such as was present so frequently at Butleigh, and only the very greatest care will enable the cheese-maker to produce good cheese under such circumstances.

There may be, then, some truth in the notion that upon certain soils it is far more difficult to make good cheese than upon others. The cause, it would seem probable, is not that any peculiar plants form part of the herbage, nor that the composition of the soil is very exceptional, but that several conditions combine to promote a rapid growth of plant life upon a soil rich in magnesia. Salts of magnesia thus enter the plant and have a scouring effect upon the cattle. Even when not marked it might be sufficient to cause a constant effect, which would soon appear so natural as to escape notice. The only remedy that can be suggested at present is scrupulous cleanliness, which, though necessary at all times, is indispensable upon soils of this nature.

## VII.—CONCLUSION.

The results of this year's work confirm in every particular the conclusions which have been come to in previous Reports. It is scarcely necessary to reiterate the conclusions come to in this Report.

The work of the three years may be summarised as follows:—

To make Cheddar Cheese of excellent quality, one, and one single organism only is necessary in the milk, that is the *Bacillus Acidi Lactici*; every other organism present will tend to make the work more difficult. Hence, it is imperative that scrupulous cleanliness be the primary consideration of the farmer and of the cheese-maker, as of all those who have in the least possible respect to deal with the cows, the milk, or the apparatus employed.

Secondly. No matter what system of manufacture be adopted, two things are necessary—two results must be obtained. The one is that the whey be separated from the curd so that when the curd is ground it shall contain not less than 40 per cent. of water, nor more than 43 per cent.; and the other is that the whey left in the curd shall contain developed in it before the curd is put in the press at least 1·0 per cent. of lactic acid, if the cheese is required for sale within four months, and not less than ·8 per cent. of lactic acid, if the cheese is to be kept ripening for a longer period.

Lastly, the quality of the cheeses which comply with the foregoing standards will vary according to the quality of the



milk from which they have been made, and, proportionately, to the amount of fat present in that milk. The fat is the constituent which most affects the quality of the cheeses, hence it is not possible to expect the same quality of cheese to be made from land which yields large quantities of poor milk as from land which yields small quantities of rich milk. But, with due care, the larger yield of cheese which can be obtained from the poorer milk should balance in value that of the higher quality which can be made from the richer milk-yielding pastures.

#### VIII.—FUTURE WORK.

That there is much yet to be learnt must be apparent to all. 1st. It is necessary to still further study the influence of soil upon the yield and quality of milk, and its value for cheese-making.

2ndly. It is necessary to see if there is any reason why so many systems of cheese-making should be adopted, and whether it would not be possible and advantageous to reduce the systems so that the best might be more widely adopted. At present the systems adopted in adjacent dairies are often so distinct that the makers can give little help to one another in time of trouble. This does not tend to improve the method of any of them, while if they were all making upon the same system, there would be common ground of interest and a friendly rivalry which would greatly help to improve the general make throughout the county.

Meantime, science should be at work, trying to solve the problems which arise each year, and in each district. If the cheese-makers themselves would only realise that this work is being done for their good and in order to help them to earn their living; and if they would utilise the School as a centre from which they might gain some little scientific, if not practical, assistance, they would not only help on a good work, but might derive some personal advantage from laying before me the difficulties they had to contend with in their cheese-making.

Mr. Oswald Hewitt assisted me again in the work during the whole period.

I cannot close this Report without thanking Mr. Neville Grenville for the very great personal kindness shown to me, and the material assistance which he rendered in the work. Every one was willing to lend me a helping hand, and to supply any information I required. If in my desire to seek out facts, and get at the root of everything I have at times appeared too inquisitive or been too troublesome, my excuse must be the deep interest I take in striving to conquer the difficulties which are met with by those who manufacture Cheddar Cheese.

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## The Note-Book.

### 1.—*How Farmers should use the Fertilisers and Feeding Stuffs Act.*

LAST year saw an Act passed, entitled The Fertilisers and Feeding Stuffs Act, which, if properly carried into effect, will prove of very great value to the farmers of England. It is in the hope of making the provisions of the Act better known, and of indicating how farmers may best put them into operation, that these Notes are published.

#### THE PROVISIONS OF THE ACT.

These are well set forth in a leaflet, published by the Board of Agriculture,\* and may be classified as follows :—

- (1.) Provisions relating to the warranty to be implied on the sale of a fertiliser or feeding stuff;
- (2.) Provisions relating to taking samples and obtaining analyses; and
- (3.) Provisions relating to offences, penalties, and legal proceedings.

#### WHAT THE ACT PROVIDES FOR.

Every person who sells a fertiliser (*i.e.* any article sold for use as a fertiliser of the soil) which has been manufactured or subjected to any artificial process in the United Kingdom, or imported from abroad, is required to give to the purchaser an invoice stating the name of the fertiliser, and whether it is artificially compounded or not, and what is, at least, the percentage of the nitrogen, phosphates soluble and insoluble (*i.e.* in water), and potash, if any, contained in the fertiliser, and this invoice is to have effect as a warranty by the seller of the statements contained therein. This provision does not apply to a sale where the whole amount sold at the same time weighs less than half a hundredweight.

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\* A  $\frac{18-93}{1}$ .

Every person who sells a feeding stuff (*i.e.* any article sold for use as food for cattle) which has been artificially prepared is required to give to the purchaser an invoice, stating the name of the feeding stuff, and whether it has been prepared from one substance or seed, or from more than one substance or seed, and this invoice is to have effect as a warranty by the seller of the statements contained therein.

Where any feeding stuff is sold under a name or description implying that it is prepared from any particular substance, or from any two or more particular substances, or is the product of any particular seed, or of any two or more particular seeds, and without any indication that it is mixed or compounded with any other substance or seed, there is to be implied a warranty by the seller that it is pure, that is to say, is prepared from that substance or those substances only, or is a product of that seed or those seeds only.

On the sale of any feeding stuff, there is to be implied a warranty by the seller that the article is suitable for feeding purposes.

Any statement by the seller of the percentages of nutritive and other ingredients contained in any feeding stuff, made after the commencement of the Act in an invoice of such feeding stuff, or in any circular or advertisement descriptive of such feeding stuff, is to have effect as a warranty by the seller.

For the purposes of the Act, the expression "cattle" means bulls, cows, heifers, calves, sheep, goats, swine, and horses.

#### PROVISIONS RELATING TO TAKING SAMPLES AND OBTAINING ANALYSES.

The Act provides for the appointment of a Chief Analyst by the Board and of District Analysts by Local Authorities.

Every purchaser of any fertiliser or feeding stuff, on payment to a District Analyst of a fee sanctioned by the body who appointed the Analyst, is entitled, within ten days after delivery of the article to the purchaser, or receipt of the invoice by the purchaser, whichever is later, to have the article analysed by the Analyst, and to receive from him a certificate of the result of his analysis in the form prescribed by the Board.

If the seller or the purchaser objects to the certificate of the District Analyst, one of the samples selected, or another sample selected in like manner, may, at the request of the seller, or, as the case may be, the purchaser, be submitted to the Chief Analyst with the invoice or a copy thereof and any such circular or advertisement as above-mentioned, and the seller, or, as the case may be, the purchaser, is, on payment of a fee sanctioned by the Treasury, entitled to have the sample analysed by the

Chief Analyst, and to receive from him a certificate of the result of his analysis. The fees approved by the Treasury for analyses by the Chief Analyst are, one guinea for each of the more difficult and complex samples, and half a guinea for each of those of a simpler character, the Chief Analyst determining in each case whether the higher or lower fee shall be charged.

The costs of and incidental to obtaining any analysis in pursuance of the above provisions are to be borne by the seller or the purchaser in accordance with the result of the analysis, and to be recoverable as a simple contract debt.

**PROVISIONS RELATING TO OFFENCES, PENALTIES, AND LEGAL PROCEEDINGS.**

Section 3 of the Act makes the seller of any fertiliser or feeding stuff liable (without prejudice to any civil liability), on summary conviction, to a fine not exceeding 20*l.* for a first offence, and for any subsequent offence to a fine not exceeding 50*l.*, if he commits any of the following offences; namely,—

(a.) Fails without reasonable excuse to give, on or before, or as soon as possible after, the delivery of the article, the invoice required by the Act; or

(b.) Causes or permits any invoice or description of the article sold by him to be false in any material particular to the prejudice of the purchaser; or

(c.) Sells as a feeding stuff any article which contains any ingredient deleterious to cattle, or to which has been added any ingredient worthless for feeding purposes and not disclosed at the time of the sale.

In any proceeding for an offence under this section it will be no defence to allege that the purchaser, having bought only for analysis, was not prejudiced by the sale.

A person alleged to have committed an offence under the preceding provisions in respect of an article sold by him, will be entitled to the same rights and remedies, civil or criminal, against the person from whom he bought the article as are available to the person who bought the article from him, and any damages recovered by him may, if the circumstances justify it, include the amount of any fine and costs paid by him on his conviction, and the costs of and incidental to his defence on such conviction.

If any person knowingly and fraudulently—

(a) tampers with any parcel of fertiliser or feeding stuff so as to procure that any sample of it taken in pursuance

of the Act does not correctly represent the contents of the parcel ; or

(b) tampers with any sample taken under the Act ;

he will be liable, under section 6 of the Act, on summary conviction, to a fine not exceeding 20*l.*, or to imprisonment for a term not exceeding six months.

Section 7 of the Act provides that a prosecution may be instituted either by the person aggrieved or by the Local Authorities, or by any body or association authorised in that behalf by the Board, but that in the case of an offence under section 3 of the Act, no prosecution shall be instituted by the person aggrieved or by any body or association except on a certificate by the Board that there is reasonable ground for the prosecution.

It also provides that any person aggrieved by a summary conviction under the Act may appeal therefrom in accordance with the provisions of the Summary Jurisdiction Acts.

At the hearing of any civil or criminal proceeding with respect to any article analysed in pursuance of the above provisions, the production of a certificate of the District Analyst, or, if a sample has been submitted to the Chief Analyst, then of the Chief Analyst, will be sufficient evidence of the facts therein stated, unless the defendant or person charged requires that the Analyst be called as a witness.

#### **HOW TO PROCEED WHEN PURCHASING A MANURE OR FEEDING STUFF.**

It will be evident that if the farmer wishes to make use of this Act, his first consideration must be to obtain a guarantee with every article he purchases. What then should he require? These conditions of purchase have been carefully considered by the Royal Agricultural Society, and they have published what, in their opinion, members of their Society should demand. We will follow this advice, stating, however, some additional points which we should advise farmers to attend to.

Farmers when purchasing fertilisers and feeding stuffs should in all cases insist on having an invoice, and see that such invoice contains all the information the Act demands.

This, in the case of Fertilisers, includes :

1. The *name* of the fertiliser.
2. The *minimum* analysis of the fertiliser in respect of its principal fertilising constituents.

And in the case of Feeding Stuffs :

The *name* of the article,

In addition we strongly advise purchasers to obtain with Feeding Stuffs the following particulars:—

The *minimum* analysis of the substance in respect of its principal feeding constituents.

The following standards will help to show farmers what they have a reasonable right to expect the most important substances which they purchase to contain.

They should be *guaranteed* as follows :

#### *Fertilisers.*

**Raw Bones, Bone-meal, or Bone-dust** to be “pure,” and contain not less than 45 per cent. of phosphate of lime, and not less than 3 per cent. of nitrogen, equal to about 4 per cent. of ammonia.

**Boiled Bones** to be “pure,” and contain not less than 55 per cent. of phosphate of lime, and not less than .8 per cent. of nitrogen, equal to 1 per cent. of ammonia.

**Dissolved Bones** to be “made from raw bone and acid only,” and to contain 12–17 per cent. of soluble phosphate, 12–20 per cent. of insoluble phosphates, and 2 per cent. of nitrogen.

**Mineral Superphosphate** of lime to contain from 23 to 28 per cent. of soluble phosphate.

**Compound Artificial Manures, Bone Manures, Bone Compounds, &c.,** to be sold by analysis stating the minimum percentages of soluble phosphates, insoluble phosphates, nitrogen, and potash if present.

**Peruvian** and other **Guanos** to be described by their name, and to be sold by analysis stating the minimum percentages of phosphates, nitrogen, and potash if present

**Sulphate of Ammonia** to be “pure,” and contain not less than 19 per cent. of nitrogen, equal to 23 per cent. of ammonia.

**Nitrate of Soda** to contain not less than 15 per cent. of nitrogen, equal to 91 per cent. pure nitrate of soda.

**Kainit** to contain 10–12 per cent. of potash, equal to 19–22 per cent. of sulphate of potash.

**Basic Slag** to contain about 14–18 per cent. phosphoric acid, equal to about 30–40 per cent. phosphate of lime, and to be of standard fineness.

In order to try and evade the Act we understand some firms are guaranteeing merely minimum quantities of constituents, for example, guano, dissolved bones, &c., as containing 1 per cent. phosphates, 1 per cent. nitrogen, and 1 per cent. potash.

Farmers ought not to purchase any manures so guaranteed, for if the manures only contain these constituents they are not worth buying; yet, *if they contained no more, the farmer would have no redress.*

#### *Feeding Stuffs.*

**Linseed-cake, Cotton-cake** [decorticated and undecorticated], and **Rape-cake** to be **pure**, *i.e.* prepared only from the one kind of seed from which their name is derived, and the percentage of oil, albuminoids (nitrogenous compounds), and carbohydrates to be stated.

**Bean Meal, Rice Meal, &c.**, to be *pure*, and the percentage of oil, albuminoids, and carbohydrates to be stated.

**Compound Feeding-cakes, mixed meals, &c.**, to contain stated percentages of oil, albuminoids, and carbohydrates.

Having taken care to make all purchases upon the preceding lines, the farmer when he receives the bulk must next determine whether he will have a sample sent for analysis to the District Analyst or not. In the case of fertilisers, he can only do this provided he has purchased not less than  $\frac{1}{2}$  cwt. of the material. If he desires to make use of the Act, he must proceed in accordance with the regulations laid down by the Board of Agriculture as to the taking of samples.

#### PROCEEDINGS BY BUYER TO PROCURE SAMPLES.

When the buyer desires to have the substance analysed, "he is within ten days after delivery of the article to him or receipt of the invoice, whichever is later, either:—

(a) to take samples of the article himself, or:—

(b) to give notice in writing to the District Analyst, stating that he desires that the samples shall be taken by the District Analyst."

It will be seen that two courses are open. Either the farmer may take samples himself, or he may request the Analyst to do so. We strongly urge farmers to save expense and trouble so far as possible by taking samples themselves. But in doing so, they must be careful to comply *in every detail* with the regulations of the Board of Agriculture, which are as follows:

#### REGULATIONS AS TO SAMPLES TAKEN BY THE BUYER.

When the buyer intends to take the samples himself, he is to give three days' notice in writing of such intention to the seller, with particulars as to the place, day, and hour of

sampling. If the seller does not attend, the samples are to be taken in the presence of a witness, who is to initial each sample.

In taking these samples, the following instructions must be complied with:

**GENERAL REGULATIONS FOR TAKING SAMPLES.**

When the fertiliser is delivered in bags or other packages, a number of bags or packages are to be selected as follows, viz.:

Not less than 2 bags or packages where the quantity does not exceed $\frac{1}{2}$ ton.			
" 3	"	"	2 tons.
" 5	"	"	5 tons.
" 10	"	"	exceeds 5 tons.

The selected bags or packages are to be emptied separately on a clean and dry stone or wooden floor, worked up with a spade, and one spadeful from each set aside. The separate spadefuls are then to be thoroughly mixed and any lumps broken up by the hand or spade. From this mixture three samples of from  $\frac{1}{2}$  lb. to 1 lb. are to be taken and carefully and securely packed, a sufficient quantity of the mixture for such purpose being in the first place separated from the bulk.

When the fertiliser is delivered in bulk, then, in like manner, portions are to be taken from different parts of the fertiliser, and thoroughly mixed together, and the samples taken from a portion of such mixture.

When the fertiliser consists of bulky materials, uneven in character and likely to get matted together, such as shoddy, wool, refuse, hair, &c., portions are to be taken from the selected bags or packages, or from different parts of the fertiliser; if in bulk, the matted portions torn up, and the whole mixed as above directed, but the samples are to be somewhat larger.

When the feeding stuff is in the state of meal or grain it is to be sampled in the same manner as prescribed for fertilisers. When the feeding stuff is in the state of cake, a number of cakes are to be selected as follows:

Not less than 3 cakes where the quantity does not exceed 1 ton.			
" 5	"	"	5 tons.
" 10	"	"	exceeds 5 tons.

A section of about 4 inches wide, across the whole breadth, is to be taken from the middle of each selected cake, and these sections subdivided, also across the whole breadth, into three parts. Three samples shall then be taken, each containing one of these subdivided parts of each selected cake.



If the cakes be much broken up, the samples are to be taken in as nearly as possible the same manner as in the case of entire cakes.

In the case of a feeding stuff, if any appreciable portion be mouldy, sour, or otherwise unsuitable for feeding purposes, or if cakes be full of hard lumps, or have cotton or hair attaching to them, separate samples are to be taken of such portion or cakes and of the residue of the feeding stuff. An estimate is to be formed as to the proportion of the feeding stuff represented by each sample.

When the feeding stuff is in a fluid or semi-fluid condition, a number of packages, in the same proportion to the total quantity as in the case of meal or grain, are to be selected, and a portion taken from each. The several portions are then to be well mixed together in a clean vessel, and three samples taken therefrom as in other cases.

#### GENERAL DIRECTIONS.

In every case the sampling is to be done as quickly as is possible consistently with due care, and the material is not to be allowed to be exposed any longer than is absolutely necessary.

The object of the person taking the samples is to obtain samples fairly representing the bulk from which they are drawn, and therefore no bag, package, or cake is to be selected which has apparently been damaged while in the possession of the buyer.

Each sample is to be packed in a dry clean bottle or jar, or (except in the case of a fertiliser) in a dry clean tin, or in some other suitable manner, so that the original composition of the fertiliser or feeding stuff may be preserved.

The samples are to be so packed and secured that they cannot be tampered with, and to be sealed and initialed by the person taking the sample, and numbered consecutively.\* They may also be sealed by the buyer, and by the seller, if present and so desiring. Each sample is to be endorsed with the name of the article, and the date and place of the sampling.

#### REGULATION AS TO SAMPLES SEALED BY SELLER AND BUYER.

Where any samples are taken in the presence of and sealed by the seller as well as the buyer, such samples are to be deemed, as between the buyer and seller, to have been taken in accordance with these regulations.

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\* This means that the three samples must be marked I., II., and III.

**EXPLANATION OF THE PRECEDING AND ADVICE THEREON.**

In packing the samples two things must be considered, 1st, that, as in many cases they will be sent by Parcel Post, they should not be easily breakable; and 2ndly, that the sample kept and that handed to the seller should not be liable to lose moisture.

We would recommend farmers, so far as possible, to pack the samples in tins. And none are better for this purpose than Noakes's patent lever tins, manufactured by Henry Grant & Co., of Bermondsey, for they are air tight, and not liable to come open. But, as the Board of Agriculture have prohibited tins for manures, such substances must be packed in bottles. These must be very wide mouthed, the cork should be pressed in level with the top of the bottle, and sealing-wax applied all over the cork and mouth of the bottle.

Each bottle must then be labelled, and the label must contain the information required by the regulations. We recommend the following form of label, and would suggest that each County Council should supply them to farmers upon application.

**LABELS FOR SAMPLES.**

SPACE FOR ANALYSTS NUMBER.	<b>SOMERSET COUNTY COUNCIL.</b>	
	<b>FERTILISERS AND FEEDING STUFFS ACT.</b>	
Sample of _____ No. _____		
Taken at _____		
On _____		
Initials of Sampler _____		
Initials of Seller _____ or Witness _____		

When the tin is full put on the lid tight. Wrap up the tin in brown paper, tie it and seal over the string, also paste label over the string. It is quite impossible for a sample secured in this way to be tampered with. Where the samples have to be sent by post it will be necessary to pack the bottle in a box, but a tin may be again covered with paper, a label tied on, and sent by post, the stamps being always placed upon the label. We would recommend County Councils to have labels, with the address of the Analyst and the name of the county from which

the sample is sent, printed and distributed among the farmers. When the samples have been taken, the following instructions must be complied with.

#### DISPOSAL OF SAMPLES.

“ The buyer is immediately to deliver or send by post to the District Analyst one of such samples, with a report of the case, the invoice or a copy thereof, and also, in the case of a feeding stuff, any circular or advertisement of the seller descriptive of the article to be analysed, which the buyer may wish the District Analyst to consider in making his analysis and giving his certificate.

One of the remaining samples is to be delivered or sent by post to the seller, and the other is to be retained by the buyer.”

It will be necessary for the farmer to send the Analyst at the same time a postal order for the fee which he has to pay him according to the arrangement of the County Council for his district.

#### REGULATIONS AS TO SAMPLES TAKEN BY DISTRICT ANALYST.

Should the farmer desire to have the sample taken by the District Analyst, or by some one appointed by him, then the following regulations must be complied with :

“ When the buyer or the seller desires that the samples shall be taken by the District Analyst, he is to give notice in writing to that effect to the District Analyst. Such notice is to contain the names and addresses of the buyer and the seller, and such particulars as may be necessary to enable the District Analyst to identify the article to be analysed. A copy of any such notice given by the seller is to be sent at the same time to the buyer.

“ The District Analyst is to give three days’ notice to the seller and to the buyer, as to the place, day, and hour of sampling, to enable them to be present at such sampling, if they so desire.

“ One of the samples taken by the District Analyst is to be retained by him, another delivered or sent to the seller, and the third delivered or sent to the buyer.

“ Any notice or sample required by these Regulations to be given or sent by the District Analyst to the buyer or the seller, may be sent by post to the respective names and addresses stated in the above-mentioned notice to the District Analyst.

“ The District Analyst, at or before the time of sampling, is to be supplied by the buyer with the invoice or a copy thereof, and also, in the case of a feeding stuff, with any circular or advertisement of the seller descriptive of the article to be

analysed, which the buyer may wish the District Analyst to consider in making his analysis and giving his certificate.

“The District Analyst is to provide any receptacle or other thing required by him for the samples.”

It is to be regretted that this Act could not have been carried out without the necessity of arranging for samples to be taken by the Analyst, for in many cases he will be located many miles from the county for which he acts. Foreseeing this, the Board of Agriculture have arranged that an Analyst may employ samplers to take samples for him. But now comes a difficulty, whom can he employ? One or two courses appear to us feasible. Thus, it would be advantageous, if it could be conveniently adopted, for the Joint Committee in each county to authorise the Superintendents of Police to act as samplers for the District Analyst in carrying out the provisions of this Act, any expense which they might be put to being met by a small fee to be charged to the farmer who does not take the samples himself. Or it might be possible for the County Council to permit the Inspectors of Weights and Measures to act for the District Analyst upon the same terms. It is very evident that the Board of Agriculture anticipated that the Analyst would not himself be able to take samples, for they expressly provide in their regulations that the word “District Analyst” shall include any person authorised by the District Analyst to take samples with the approval of the body who appointed the District Analyst. Whoever may act for the District Analyst, we think it would be best that the requisition by the farmer should in all cases be made in the first instance to the District Analyst himself, who should instruct those acting for him, when to take the samples.

#### THE REPORT OF THE ANALYST.

When the analysis is completed, the Analyst will send his Report to the farmer who sent him the sample; and we think it would also be desirable for a copy of that Report to be sent to the seller.

If the Report shows that the substance bought is what it purported to be, the matter ends. But if the Report on the sample shows that the bulk is not of the quality which it should be, and that the farmer has not been properly treated, then the farmer must consider what steps he will take.

Where the difference between the guarantee or invoice and the analysis is slight, then the farmer should endeavour to come to some equitable arrangement with the seller; and, if he cannot arrange this, he may take *civil* proceedings to obtain

redress for any loss he may have sustained from the goods not coming up to the guarantee.

But if the Report of the Analyst shows that the seller has committed any of the offences set forth in section 3 of this Act, which are quoted on page 179 of this article, then it will be necessary to take *criminal* proceedings against the seller.

To this end the buyer may either lay the matter at once before the Board of Agriculture, for he cannot commence a criminal prosecution in a Court of Law before the Board has sanctioned such action; or he may bring the facts under the notice of any body or society interested in such matters, *e.g.* a farmer's club or chamber of agriculture, with a view to their deciding whether they will apply to the Board for leave to prosecute on his behalf.

The County Council are also authorised to prosecute; but it cannot for one moment be expected that the County Council, having gone to the expense of providing a competent Analyst for the county, will also act as prosecutor for the farmer. If this Act is to be of advantage, the farmers must have the courage to fight their own battles, now that every possible help has been given them for the purpose.

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## 2.—*Horse-Feeding.* By R. WARRINGTON.

DURING recent years extensive experiments on horse-feeding have been carried on in Paris: the earlier series were conducted by A. Müntz upon the horses of a tramway company; the somewhat later series, still in progress, have been conducted by Grandeau and Leclerc upon the horses of a cab company. Both these investigations are of great value, having been carried out on a much larger scale than is usual in scientific investigations, and with unstinted labour and expense. They form a most important supplement to the painstaking researches executed by Wolff at Hohenheim, in which most of the trials were made on a single horse. On these three researches nearly the whole of our exact knowledge of horse-feeding depends.

The main object of investigations of this kind is to arrive at certain fixed data, which may be relied on to hold good whenever certain conditions are fulfilled. But when the subject of the investigations possesses variable characteristics, that object is naturally more difficult to attain. This difficulty has been somewhat prominent in experiments with horses. Horses are not so generally alike in their powers of digestion, nor in the use they make of food, as a flock of sheep or a herd of cattle. This is, perhaps, partly because the sheep and cattle are always in repose,

while the horse being worked to the full extent of his powers any individual weakness becomes apparent. The horse, too, is kept in work till old age, and we consequently have to deal with him both in strength and feebleness. Baudement placed 168 of the French cavalry horses on the same rations, and studied the alterations in weight of each horse; he found that horses which were above the mean height, above the mean weight, and below the average age, gave the best return for the food consumed.

Although a horse may be fed on a great variety of foods, there are natural limitations to the diets which can be practically employed. It has been found possible for experimental purposes to feed a horse entirely on corn—oats, barley, maize, and beans have all been given for a time separately and alone—but the experiment requires care, and is sometimes attended with fatal results. It is universally acknowledged that a good horse ration must possess a certain bulk if the animal is to be preserved in good health.

The bulk of food which a horse can consume is one of the natural limitations of his ration. A diet may be most wholesome, but a horse may not be able to eat enough of it to maintain his condition during hard work. With such a diet one horse may be more successful than another, simply because he is able to consume a greater bulk of food. The stomach and intestines, moreover, accommodate themselves gradually to the bulk of the food, so that a horse passing from a concentrated to a bulky ration will, after a time, do much better than he did at first. Hence, all considerable changes of diet should be brought about very gradually.

Although bulky foods, such as hay or straw chaff, are necessary ingredients of horse-rations, a horse is by no means so capable of digesting vegetable fibre as an ox or sheep; the horse, in fact, is not provided with the digestive apparatus belonging to ruminant animals. In Wolff's experiments at Hohenheim, in which the same diet was supplied both to a horse and sheep, the horse succeeded worst in his digestion of the fibre of straw-chaff, of grass, and of meadow hay, while in the case of clover and lucerne hay he nearly equalled the sheep in digestive power. Wolff in his last report comes to the remarkable conclusion that the fibre digested by a horse is of no value, either as a means of sustenance while at rest, or for the production of work. No direct proof of this is furnished; the conclusion is drawn from the lower nutritive and force-producing value of the digested matter of diets including hay. The conclusion has not been generally accepted, and the facts will, perhaps, bear another interpretation.

**MAINTENANCE RATIONS.**

We shall naturally speak first of the results arrived at respecting maintenance rations. By a maintenance ration is meant the minimum supply of food which will keep a horse from losing weight while at rest in the stable, with only the small amount of walking exercise necessary to preserve health. In Grandeau's experiments with meadow hay alone as the diet, three horses were kept at rest for various times, amounting in all to four or five months each, half an hour's walking exercise being allowed per day. Each horse received 17·6 lbs. of hay per day, and this proved exactly sufficient to maintain their weight unaltered. The amount digested by each horse was determined through the whole period by analysis of the solid excrements. The three horses did not digest the hay equally well, and thus each horse was really nourished, and its weight maintained, by somewhat different amounts of food. The average result of three months' feeding for each horse was as follows:—

				Dry Organic Matter Digested per Day.		
				Live Weight of Horse.		
					Actual.	Per 1,000 lb. Live Weight.
				lbs.	lbs.	lbs.
No. 2	..	..	..	897	5·90	6·57
No. 3	..	..	..	853	5·98	7·00
No. 1	..	..	..	806	6·31	7·82
Mean of three horses for 14 months					.. ..	7·02

Grandeau and Leclerc experimented with many other diets, but in only a few cases did their maintenance diets exactly meet the wants of the horse. The results in these cases are given in the next table, but the results with other diets are of far less authority than those obtained in the more extended experiments with meadow hay:—

Diet.	Weight of Horse.	Dry Organic Matter per Day.		
		In Ration.	Digested.	Digested per 1,000 lb. Live Weight.
	lbs.			
Hay alone (mean) .. ..	868	14·08	6·09	7·02
Maize and oat straw .. ..	1,013	11·57	8·33	8·22
Maize, oats, hay, and straw .. ..	972	9·48	7·30	7·50
Do. do. .. ..	906	9·49	6·74	7·45
Oats alone (crushed) .. ..	913	8·59	6·41	7·02

The figures in the table illustrate very plainly the weakness of a diet containing much hay or straw, namely the large quantity which must be given to the animal to produce a certain effect; this is, of course, owing to the low digestibility of these foods. That the digested fibre of hay is of no nutritive value is not borne out by the results before us. Indeed, as far as these figures go, the digested matter of hay appears to be as nutritive as the digested matter of oats. On the other hand, the introduction of straw into the diet is apparently attended with a lowering of the nutritive power of the digested matter. Excepting the single experiment with maize and oat straw, the results are fairly uniform, and show that the same weight of digested matter has generally a very similar nutritive value, though different foods may have been consumed.

At Hohenheim it was found, as a mean of many experiments, that about 8·3 lbs. of digested food per 1000 lb. live weight were required per diem for maintenance during complete rest. From this amount Wolff would deduct the whole of the digested fibre, leaving 6·7 lbs. as the amount of effective food required to maintain the weight of a 1000 lb. horse during complete rest. If we deduct the digested fibre from the digested organic matter in the French experiments with hay only, we arrive at 5·5 lbs. of effective food as the sufficient quantity for a 1000 lb. horse. The difference between the German and French experiments is thus not explained by assuming that the digested fibre is of no value.

In constructing a maintenance diet, for any animal, it is of great importance to know what is the smallest quantity of albuminoids required to replace the daily waste of the body; the ration should of course never supply less than this amount. The quantity does not seem to have been exactly determined in the case of the horse, but, judging from the French experiments, it must be extremely small. The average amount of digested albuminoids received daily by the three horses during fourteen months while fed entirely upon hay was only 212 grams, or 538 lb. per 1000 lb. live weight per day. The average amount of digested nitrogen was 36·7 grams, or ·093 lb. per 1000 lb. live weight. These quantities are quite similar to those determined by German experiments as minimum quantities for an ox of 1000 lb. live weight, kept on a maintenance diet. The minimum for the horse is, however, clearly less than the above average. Horse No. 3, during June and July, received a daily average of only 172·5 grams of digestible albuminoids in his food, or ·447 lb. per 1000 lb. live weight; yet this was apparently sufficient, as the horse gained about 5 lbs. in weight during these two months. There is yet another case, in which



the same horse received daily during one month only 0·37 lb. of digestible albuminoids per 1000 lb. live weight. The horse gained somewhat in weight while at rest; but, on the other hand, the analysis of the urine showed that he lost rather more nitrogen than he received. We should therefore be disposed to take about ·45 lb. of digestible albuminoids per 1000 lb. live weight as the minimum quantity per diem for the maintenance ration of a horse.

With such a small quantity of nitrogen in the digested food, the albuminoid ratio of the diet was, of course, very low; in the selected instance of horse No. 3 it was only 1:12·8, yet this was evidently quite sufficient.

The digestibility of a large number of foods was determined by Muntz and Grandeau, and the following table shows the average proportion of organic matter digested for 100 parts consumed in the food. The horses were at rest in these experiments, and received one kind of food only. The grains used were crushed before being eaten.

	Total organic constituents digested for 100 consumed.									
Maize .. .. .	..	..	..	..	..	..	..	..	..	94·5
Barley .. .. .	..	..	..	..	..	..	..	..	..	84·5
Beans .. .. .	..	..	..	..	..	..	..	..	..	84·5
Oats .. .. .	..	..	..	..	..	..	..	..	..	75·1
Wheat bran .. .. .	..	..	..	..	..	..	..	..	..	93·3
Meadow hay .. .. .	..	..	..	..	..	..	..	..	..	43·3-61·0
Carrots .. .. .	..	..	..	..	..	..	..	..	..	94·6

Maize and bran thus appear to be the most digestible of the ordinary horse foods.

Müntz studied the digestive functions of the horse by killing two of little value a few hours after they had been fed, and analysing the contents of the stomach and of successive portions of the intestines separately. One horse had been fed on hay, and one on wheat-bran. It appeared that all ready-formed sugar was absorbed in the stomach. Starch did not disappear in the stomach; it is digested subsequently by the pancreatic juice. When the food consisted wholly of bran, more than half of the albuminoids and a considerable proportion of the cellulose disappeared in the stomach; but when the food consisted of hay, no assimilation of albuminoids, and scarcely any of cellular matter, took place in the stomach. It is difficult to tell what occurs shortly after leaving the stomach, owing to the large quantity of digestive fluids (bile and pancreatic juice) which are poured into the canal. The largest amount of absorption apparently occurs in the large intestines and colon, and it is here that the most striking diminution takes place in the various cellulose constituents.

Müntz determined the digestibility of several kinds of oat. He points out that the weight per bushel is not always an accurate criterion of the relative value of oats. In the absence of chemical analysis, the best plan is to determine the proportion between husk and kernel; the oat yielding the highest proportion of kernel will be the best.

#### LABOUR RATIONS.

In Grandeau and Leclerc's experiments we have determinations of the proportion of food digested with different degrees of labour. Taking the mean of a very large number of experiments with different diets, and taking the proportion of organic matter digested while at rest as 1000, we have the following series of figures as representing the proportion digested during different degrees of labour:—

	Relative proportion of food digested.
At rest .. .. .	1000
Walking exercise .. .. .	1032
At work walking .. .. .	1007
Trotting .. .. .	976
At work trotting .. .. .	973
At work in cab .. .. .	959

We see here that moderate exercise is accompanied by a small but distinct improvement in the digestive functions, but that as soon as trotting commences digestion becomes less efficient than when at rest, while hard work while trotting still further diminishes the proportion of the food digested. When we look into the details we find that the starch and sugar in the food are perfectly digested under all conditions of labour. The digestibility of the fat increases with exercise, and does not diminish by labour below the point reached in repose. The digestibility of the albuminoids increases rather considerably with exercise, and diminishes sharply when trotting commences. The principal matters usually grouped as "soluble carbohydrates," but which, in this case, are merely the more digestible constituents of the fibre, undergo the greatest amount of variation, their digestibility rising considerably with exercise, and falling still more considerably with hard labour. In the case of the more insoluble portion of the fibre there is no rise in digestibility by exercise; the maximum rate of digestion is here obtained in repose, and diminishes considerably with increased bodily exertion. On the whole it appears that the constituents of the food which are most affected by rapid exertion are those whose digestion takes place to a large extent in the lower part of the intestines; the motion of the horse probably determines their more rapid passage through the system.

Grandeau's researches do not supply us with much information as to the quantity of food required for the performance of known amounts of work, for although graduated amounts of carefully measured work were performed by the horses under each diet, it was but rarely that the labour ration proved exactly sufficient for maintaining the horse's weight without gain or loss. Some points of great importance were, however, clearly made out. One of these is the great influence of pace on the amount of labour exerted, and upon the amount of food required. Thus a horse walking  $12\frac{1}{2}$  miles per day was kept in condition with a daily ration of 19·4 lbs. of hay, while a ration of 24 lbs. of hay was insufficient when the same distance was done trotting. Again, a horse walking the above distance and dragging a load, the additional work being equivalent to 1943 foot-tons, was sufficiently nourished by a ration of 26·4 lbs. of hay, but a daily ration of 32·6 lbs. (all that the horse would eat) was not enough to maintain the horse's weight when the same work was done trotting. That work is done at least cost to the system when it is done slowly is a fact well recognised by every old and feeble man, but the principle is not, I think, generally recognised as true in all cases in which labour is performed.

Some of the reasons why rapid labour is less economically performed by the horse than slow labour are readily apparent. When a horse is trotting, the frequency of the pulse, and, consequently, the internal work performed by the heart, is much increased. The horse when trotting or galloping also lifts his own weight at each step, but allows it to fall again, the result appearing only as heat. The temperature of the horse rises with exertion, and much heat is lost by the evaporation of water through the skin and through the lungs. The proportion of the food employed to produce heat is thus increased, while the proportion appearing as work is diminished. There are also mechanical reasons why rapid motion should generally consume more power than slow motion, even when the distance travelled and the weight moved are the same in each case.

Grandeau gives tables showing the temperature of the horse's body before and after work. When the work performed was at all considerable, a very distinct rise in temperature of from 2° to 4° Fahr. was observed.

The total amount of water consumed, both as **drink** and in the food, was determined daily, and also the amount voided in the urine and feces; the difference was, of course, the quantity passing off as vapour in the breath and perspiration. The latter quantity was much increased by labour, and particularly when the work was done trotting. The mean quantity of water evaporated daily, under different conditions of **exercise**, as

determined in experiments with four different diets, was as follows :—

	Water evaporated, lbs. per day.						
At rest .. .. .	..	..	..	..	..	..	6·4
Walking exercise .. .. .	..	..	..	..	..	..	8·6
At work walking .. .. .	..	..	..	..	..	..	12·7
Trotting .. .. .	..	..	..	..	..	..	13·4
At work trotting .. .. .	..	..	..	..	..	..	20·6

As already explained, the distance trotted was the same as the distance walked, and the load drawn when trotting the same as when walking. The heat consumed in the evaporation of water is very considerable; the loss of water in the breath and perspiration thus necessitates a consumption of food to produce this heat, and diminishes considerably the quantity of food available for the production of work.

The proportion of water drunk by the horse varies with the character of the food; it is smallest when the diet is largely made up of corn, and largest when meadow hay only is given. With the mixed diet employed for the Paris cab horse, the mean proportion of water to dry matter was 2·1 : 1 when the horse was at rest, and 3·6 : 1 when the horse was with the cab. When hay alone was given the proportion was about 3·3 : 1 when at rest, and 4·3 : 1 when with the cab. Individual horses differ a good deal in the quantity of water they drink.

We do not find in Grandean's researches any information as to whether a nitrogenous diet is or is not essential for the production of hard work; information on this point is furnished chiefly by the investigations of Wolff, and also by Müntz. The doctrine taught by Liebig, that only nitrogenous, muscle-forming food was capable of developing muscular force, is still to be found in popular lectures and books, and nitrogenous foods, as beans, are recommended as the only scientific diet when hard labour has to be performed. Unfortunately for such teachers, not only has science long ago abandoned the theory in question, but the plan has, from motives of economy, been also abandoned in practice, and our large tramway companies are at present feeding their horses with success on a diet largely composed of maize, and having a decidedly low albuminoid ratio.

The doctrine laid down by Wolff and his fellow-workers at Hohenheim is a very simple one. He distinguishes between the food necessary to maintain the horse at rest without loss of weight, and the extra food which must be given when work is performed, if the horse is again to be maintained without its weight suffering loss. Between the weight of digestible matter in this extra food, and the quantity of work accomplished, there is a tolerably uniform relation. Wolff reckons that digested

nutritive matter equivalent to 100 grams of starch is capable of producing 85,400 kilogram metres of work, or, expressed in English terms, 1 lb. of starch digested by a horse will accomplish 1232 foot-tons of work. This is 48 per cent. of the full work which the starch could accomplish if burnt outside the body. This result is the average of many experiments with different diets.

The horse requires for his maintenance in weight while at rest a certain daily supply of albuminoid substance, which must never fall below a certain quantity; but the extra food given when work is to be performed may consist indifferently of any digestible combustible substance, whether albuminoids or not. The horse-keeper is thus at liberty to select from a wide range of foods, and is not obliged to give a preference to those which are specially nitrogenous. It should, however, be borne in mind that what has just been said applies strictly only to horses which are already in good working condition. Horses which are in low condition, and must gain in weight of muscle before they are fit for hard work, must, of course, receive a more nitrogenous diet.

It is impossible to state exactly what is the albuminoid ratio of the diets used by the tramway companies in this country, as we do not know the composition of the foods actually used; but from the accounts published as to the rations they employ it would appear that the albuminoid ratio adopted for working horses is 1 : 7 or even 1 : 8.—*From the 'Live Stock Journal.'*

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### 3.—*On Haymaking.* By R. C. YOUNG.

AT the present day the hay crop is much more largely taken into account in the calculations and arrangements of farmers than was the case twenty or thirty years ago. This has been brought about by a combination of adverse circumstances over which we could have no control, but of which most of us have had very considerable experience.

It would be foreign to my subject were I to refer to the causes of the agricultural depression of these later years, but one of its effects has been greater freedom of cropping. In point of fact, sheer necessity has compelled us to depart from the arbitrary rotation of crops prescribed in so many leases and rigidly adhered to by our fathers; otherwise, we could not have lived by farming. The time is past for such restrictions, and the absurdity of dictating to a tenant farmer what crops are to be grown on certain fields, say, fifteen years hence, is now generally

recognised. In my own district we can crop as we like, provided we keep our land in good condition.

The hay crop lends itself more perhaps than any other to a desired alteration in the rotation of crops. In the case of the lighter soils suitable for potatoes, green cropping may be practised as much as ever, but it is different with the heavier soils. To farmers of these heavier soils, located at a distance from a market town, railway carriage or long cartage is a serious item in their expenditure. It does not pay them to grow more turnips than they can use on the farm, and they naturally grow only such green crops as are necessary to keep their land in condition. Fortunately, land that is not adapted for growing potatoes is generally suitable for the growth of hay, hence the great importance of this crop. Hence, also, a wise farmer, in sowing down land with grasses and clovers, takes care to sow seeds that will enable him to cut hay for a few years continuously, should he see fit to do so. It is always useful to have some fields, which you can either plough up or take another crop of hay from, as your forecast of the supplies and markets may suggest.

When hay is being top-dressed, in most cases the end and side ridges should be missed, as it makes the field easier opened for cutting, and it is often not desirable to have a very heavy crop next the fence.

Thanks to our friends the agricultural implement makers, haymaking nowadays is easily and expeditiously done, as compared with the practice of thirty years ago. Before the season for making hay comes round, all the necessary implements should be overhauled and put into good working order, with duplicates for weak parts; and if there are many such parts in any one implement, it is better to get rid of it at once, and replace it with the best to be had. A farmer who has a large quantity of hay to make should have that part of his business that takes him from home, and also the general work of the farm, as well forward as possible, so that he may have the full use of his staff, and be able to look after them personally when haymaking begins. He should make a careful examination of all his hay crop before beginning to cut, so as to arrange intelligently the order of cutting. Where practicable, he should begin at one end of the farm, taking all the fields of first-cut as he comes to them, and then turn back on the timothy or second-cut. This admits of his keeping his forces well together, and prevents loss of time in changing from one field to another.

Grass is ready to cut whenever the flower is off and the ear closed, as after that the nutriment leaves the stalk and goes into the seed. Of course, on farms of any considerable size

(and my remarks chiefly apply to such) the fields cannot all be cut at exactly the same stage, and where you have a mixture of seeds the different varieties scarcely ever flower simultaneously. Moreover, we cannot leave broken weather out of our calculations. If the weather is good, it is wise to begin cutting a little before the first fields have reached the stage at which we would like to have the whole crop cut; otherwise, the last fields must of necessity be too ripe before you can reach them. A clean hay crop suffers more by being allowed to ripen than one well mixed with clover. In fact, it is often profitable, if the clover is late, to allow the latter to grow a few days longer.

It is advisable to open with a scythe as much as will let the mower into the field, and also a little bit at the corners. If the crop is very heavy, the side where it is lying away from the mower should also be opened with the scythe. Having thus opened the field, it will then be seen on how many sides it will cut with most advantage. Taking into consideration the work of horses, and the making of the hay afterwards, there is no gain in cutting more than two ways, especially when there are ridges, as it is a great matter to cut square across the ridge. Sometimes, when one part of a field is standing and the other laid, by careful observation a break can be made at a point so as to allow the heavier part to be cut "against the lie." When there are two fields adjoining, with ridges running in opposite directions, it is better, if there is wind blowing, to cut the one that best suits the wind first, and, perhaps, by the next day it may be more suitable to cut the other (for the wind is not like the laws of the Medes and Persians,—it changes). If a good job cannot be made of any field by cutting it on two sides, an extra machine should be put on and it should be cut only one way. This is all the more desirable where there is clover, which drags into heaps readily. A smart lad with a hand-rake is often an advantage when the hay drags, or when in cutting two ways it is lying away from the machine. No more should be cut in one day than can be made in another, as the less there is cut the better if the weather is broken.

If the field has been cut two ways, the turners should just follow the mower. This is easier than going the opposite way, and it makes certain that the heavier part of the swathe is properly turned. The time it should lie before it is turned, and the number of turnings, depend on the weather, and also on the bulk and nature of the crop. If the weather be good, a thin, clean crop does not require much turning, but should be raked up as soon as it is ready, not allowing it to get too much sun to whiten it. If the crop is heavy and well mixed with clover, it may require to be turned twice, or even thrice, shaking up any

part that may have been dragged by the mower. When it requires to be turned more than once, care should be taken to keep it loose, and not to allow the swathe to get into a roll.

Where the ridges are round, the rows of coils might with advantage be kept all on one side.

If the old proverb—"Make hay while the sun shines"—refers more particularly to one part of haymaking than to another, it is to the ricking, as it is only on exceptional occasions that there is a good "temper" on hay without sunshine. Hay that has never got rain if put in ricks too soon, will not spoil nearly so readily as that which has got wet. But none of it should be ricked until it is ready, as hay spoiled in this way means loss both to the grower and consumer.

In making hay, as in other industries, good organisation and management go a great length in forwarding the work on hand. The workers at the various points must be well balanced, each individual have his own part to do, and all work together like constituent parts of one machine.

The introduction of the horse-fork, and the comparative ease with which we can consequently put our hay into ricks has rather checked the use of sheds for storing this crop. The result is that sheds have been used more of late for storing grain crops. I fear, however, that before many years we shall require more sheds. Whether we like it or not, it seems clear that the day is not far distant when our hay and straw must be baled for our customers. We cannot shut our eyes to the fact that baled hay takes up very much less room and is more easily handled than hay delivered loose. It also forms a much less objectionable load upon the busy streets of a city. It is when baling becomes general that I anticipate the want of shed accommodation will be pressed upon us. The great difficulty in baling would be overcome if the work could be proceeded with under cover and independently of the weather. Looking to the desirability of having hay stored in sheds for baling purposes, the necessity arises of having a horse-fork adapted for this purpose. It seems to me that shed-builders as well as implement makers might keep this in view, as not only shall we require a horse-fork adapted for the shed, but also a shed adapted for the horse-fork.—*From 'The Scottish Farmer.'*

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#### 4.—*Trials of Cream-raising Systems.\**

THE object of these trials was to compare the four systems of Cream Raising now most generally adopted, so as to determine:—1st, the relative advantages of each as regards the quantity of fat recovered in the form of butter, and 2nd, the quality of the resulting butter.

The four systems of Cream Raising tested were: 1st, the Separator; 2nd, the Jersey Creamer; 3rd, the Shallow Pan; 4th, the Scald Cream Method.

*The Separator.*—The Separator employed in the trials was the "Alpha Baby," one of Laval's Patent Machines for hand power.

*The Jersey Creamer.*—This consists of a series of metal vessels in which the milk is set at a high temperature. These vessels are jacketed, that is, they have an outer coat, which can be filled with water, and through which a stream of cold water can flow. The vessels are provided with covers to keep dust from settling upon the cream, but so constructed as to permit of a free circulation of air above the cream. The skim milk is drawn off through a very fine metal sieve which does not permit the cream to pass through it. When all the skim milk has been removed, this sieve can be withdrawn, and the cream collected in a separate vessel.

*The Shallow Pans.*—Those employed were of enamelled iron, with a surface of about 20 inches, sloping sides, and a height of about 5 inches. They held about 20 lbs. of milk each with ease.

*The Scald Cream.*—The milk for this test was set in metal pans, each capable of holding 20 lbs. After having been set the scalding was conducted on one of the milk scalders commonly used in Devonshire.

#### THE FIRST TRIAL.

More than sufficient milk for the four tests was poured into a large iron tank and well mixed. It was then weighed out in quantities of 20 lbs. by means of the Sandringham Dairy Herd Recorder. Where an accurate test has to be made, it will be found more satisfactory to weigh the milk in preference to measuring it, which, in consequence of froth and uneven floors, it is almost impossible to do accurately. The pail balances the machine, so that the weight of milk only is recorded. The first 20 lbs. was

\* From a Report on Dairy Experiments carried out by the Devon Agricultural Association in conjunction with the Devon Technical Education Committee, at Torquay, 1893.

ten for the Scald Cream test, the second 20 lbs. for the Shallow  
ns, the third 20 lbs. for the Jersey Creamer, and the fourth  
lbs. for the Separator. This was repeated three times. The  
ler was then reversed, the Separator having the first 20 lbs.  
ighed out, the Jersey Creamer the second, and so on. Thus  
each of the tests was allotted 100 lbs. of milk. The com-  
sition of the milk was as follows:—

Fat .. .. .	per cent.	3·64
Casein, sugar, &c. .. .. .	„	9·04
Total solids .. .. .	„	12·68

nce each system received 3·64 lbs., or 3 lbs. 10 ozs. of pure  
tter fat.

*No. 1. Separator.*—The milk was warmed to 90° Fahr.  
paration was commenced at 11.25 A.M., and finished at 11.52,  
ving taken 27 minutes.

Weight of skim milk .. .. .	lb.	oz.
Weight of cream .. .. .	90	0
Loss .. .. .	9	14
		2

The temperature of the cream was 75° Fahr. The separated  
lk was submitted to analysis, and found to contain ·22 per  
it. of fat. The total quantity of fat left in the separated  
lk was ·198 lb., or 3·168 ozs. The cream was ripened at a  
perature of from 57° Fahr. to 61° Fahr. Before churning,  
temperature was lowered to 55° Fahr. After having been  
shed when in the granular state, it was brined for 10 minutes  
th 1 gallon of brine containing 2 lbs. of salt. All the butter  
sequently made in these tests, except that from the scald  
am, was treated in precisely the same way, both as regards  
perature of churning, and the amount and strength of the  
ne. The weight of the butter obtained was 3 lbs. 10 ozs.  
e analysis of this butter, No. 1 (see table, p. 206), shows that  
contained 87·4 per cent. of fat. The result of this trial  
y therefore be summarised as follows:—

Fat recovered in butter .. .. .	lb.	oz.
Fat lost in skim milk .. .. .	3	3
Fat lost in manufacture of butter .. .. .	0	3
	0	4
Total fat .. .. .	3	10

*No. 2. The Jersey Creamer.*—The 100 lbs. of milk allotted  
this system was heated to 110° Fahr., and set at 11.20 A.M.,  
stream of water being allowed to flow through the apparatus.  
e temperature of this water was not so low as could be

desired, but was the lowest procurable under the circumstances. One of the drawbacks of conducting such a trial as this at a Show is the impossibility of having the best conditions for the success of any system of butter making. The skim milk was drawn the next day. It took 15 minutes to obtain the cream, and the temperature of the cream was 57° Fahr. The weight of the skim milk was unfortunately not recorded, but may be taken as about 90 to 91 lbs. It contained by chemical analysis ·61 per cent. of fat, so that the total amount of fat left in must have been approximately ·549 lb. or 8·7 ozs. The weight of the cream was 8 lbs. The cream was allowed to ripen, and after being brought to 55° Fahr., was churned and made into butter, the weight of butter obtained being 3 lbs. 4½ ozs. The composition of this butter, No. 2, is given in the table. The result of this trial may, therefore, be summarised as follows:—

	lb.	oz.
Fat recovered in butter .. .. .	2	13
Fat lost in skim milk .. .. .	0	9
Fat lost in manufacture of butter .. .. .	0	4
Total .. .. .	3	10

The skim milk was subsequently passed through the Separator and cream obtained, from which upon churning 2½ ozs. of butter were obtained.

*No. 3. The Shallow Pans.*—The 100 lbs. of milk were warmed and set at from 85° to 86° Fahr. They were skimmed twice. The temperature of the cream was 59° Fahr.

	lb.	oz.
Weight of the skim milk .. .. .	85	12
Weight of cream .. .. .	12	10
Loss by evaporation, &c. .. .. .	1	10
Total .. .. .	100	0

The skim milk contained by analysis ·46 per cent. of fat, or a total weight of ·394 lb. or 6·3 ozs. The cream was set to ripen and churned at a temperature of 55° Fahr., in all respects as the preceding creams. The weight of butter obtained was 3 lbs. 8 ozs. The composition of this butter, No. 3, is given in the table, p. 206. From these results we obtain the following:—

	lb.	oz.
Fat recovered in butter .. .. .	2	15
Fat lost in skim milk .. .. .	0	6
Fat lost in manufacture of butter .. .. .	0	5
Total .. .. .	3	10

skim milk was subsequently put through the Séparator, from the cream thus obtained  $6\frac{1}{2}$  ozs. of butter were made in turn.

4. *Scald Cream.*—The milk was set in five pans, each containing 20 lbs. It was when set at a temperature of  $72^{\circ}$  to ahr. The temperature of the milk the next morning was ahr., and scalding commenced 24 hours after setting. The time taken in scalding varied, as also the temperature to which the milk was heated, as shown in the following table :—

1st pan ready	11.20 A.M.,	temp.	$180^{\circ}$	Fahr.
2nd	„	11.25	„	$170^{\circ}$ „
3rd	„	11.28	„	$176^{\circ}$ „
4th	„	11.30	„	$176^{\circ}$ „
5th	„	11.33	„	$184^{\circ}$ „

Average temp. of scald  $177^{\circ}$  „

The cream was taken off these pans at 10.24 A.M. the following

weight of the skim milk was  $92\frac{3}{4}$  lbs., and it contained analysis 54 per cent. of fat. Thus the total quantity of fat left in the skim milk was 5 lb. or 8 ozs. The cream was churned into butter in the recognised Devonshire method with the use of a tub:  $3\frac{1}{2}$  ozs. of salt were used. The weight of butter made was 3 lbs. 9 ozs. As the butter milk seemed very rich in cream it was preserved, and will be again referred to. The butter was submitted to analysis with the results shown in the table, No. 4. From these figures we obtain the following :—

	lb.	oz.
Fat recovered in butter .. .. .	2	$12\frac{1}{2}$
Fat lost in skim milk .. .. .	0	8
Fat lost in manufacture of butter .. .. .	0	$5\frac{1}{2}$
Total .. .. .	3	10

#### THE SECOND TRIAL

was carried out in all respects similarly to the preceding, except in so far as may be hereinafter mentioned. 100 lbs. of milk were allotted to each system, the composition of the milk being as follows :—

Fat .. .. .	per cent.	3.94
Casein, sugar, &c. .. .. .	„	8.92
Total solids .. .. .	„	12.86

Each system received 3.94 lbs. or practically 4 lbs. of butter fat.

*No. 5. Separator.*—The milk was heated to 90°–91° and separated, taking 36 minutes :—

							lb.	oz.
Weight of separated milk	..	..	..	..	..	..	88	0
Weight of cream	..	..	..	..	..	..	11	4
Loss	..	..	..	..	..	..	0	12
Total							100	0

The separated milk contained upon analysis .29 per cent. of fat. The total amount of fat contained in the separated milk was therefore .255 lb. or 4 ozs. The cream was ripened and churned, the weight of butter made being 4 lbs. 4 ozs. The composition of this butter is shown in the table, No. 5, and from these figures we obtain the following results :—

							lb.	oz.
Fat recovered in butter	..	..	..	..	..	..	3	8
Fat lost in skim milk	..	..	..	..	..	..	0	4
Fat lost in manufacture of butter	..	..	..	..	..	..	0	4
Total							4	0

*No. 6. Jersey Creamer.*—The milk for this test was heated to 110° Fahr. and set. It was skimmed the following day, the temperature of the skim milk being 60° Fahr. The weight of cream obtained was 9 lbs. This was churned, and made 3 lbs. 7 ozs. of butter. Unfortunately the skim milk was accidentally poured away before being weighed and sampled. The composition of the butter is given in the table, No. 6. Thus it will be seen that the following results were obtained :—

							lb.	oz.
Fat recovered in butter	..	..	..	..	..	..	2	12½
Fat lost in skim milk and manufacture	..	..	..	..	..	..	1	3½
Total							4	0

*No. 7. Shallow Pans.*—The 100 lbs. of milk were heated to 85°–86° Fahr. and set in five pans. These were skimmed next day. The temperature of the skim milk was then 60°–61° Fahr. It weighed 81 lbs. and contained .67 per cent. of fat. Hence the total weight of fat lost in the skim milk was .54 lb. or 8½ ozs. The cream weighed 18 lbs. 4 ozs. Thus we find the 100 lbs. of milk yielded :—

							lb.	oz.
Skim milk	..	..	..	..	..	..	81	0
Cream	..	..	..	..	..	..	18	4
Loss by evaporation, &c.	..	..	..	..	..	..	0	12
Total							100	0

The cream was kept until the next day and then churned and yielded 3 lbs. 10½ ozs. of butter. The butter contained 86

per cent. of fat. We may, therefore, summarise the result of this trial as follows:—

	lb.	oz.
Fat recovered in butter .. .. .	3	2½
Fat lost in skim milk .. .. .	0	8½
Fat lost in manufacture of butter .. .. .	0	5½
Total .. .. .	4	0

No. 8. *Scald Cream*.—The 100 lbs. of milk were first heated to 90°–91° Fahr. before being placed in the five pans. Scalding commenced the next evening, the temperature of the milk being then 62° Fahr. The following figures show the temperature to which each pan was heated, the time taken in heating being about 25 to 35 minutes:—

1st pan heated to	173°	Fahr.
2nd   "   "	175°	"
3rd   "   "	174°	"
4th   "   "	174°	"
5th   "   "	188°	"
Average .. ..	177°	"

It will be noticed that this is exactly the same average as that of the first test. The pans were skimmed the next morning, and the skim milk remaining weighed 90 lbs. 11 ozs. Analysis showed this to contain .71 per cent. of fat, or a total weight of fat in the skim milk of .644 lb., which is equal to 10.3 ozs. The weight of butter made was 3 lbs. 5 ozs., and the composition of this butter is given in the table, No. 8. From these figures we can calculate that the test yielded the following results:—

	lb.	oz.
Fat recovered in butter .. .. .	2	10
Fat lost in skim milk .. .. .	0	10
Fat lost in manufacture of butter .. .. .	0	12
Total .. .. .	4	0

The skim milk from the evening trial was now put through the Separator, and a certain amount of cream obtained. The cream thus obtained, together with the cream so obtained from the first trial, and the butter milk from both first and second trial, were all mixed together and churned. The result was exactly one pound of butter, the composition of which is given in table, No. 9. From these figures it can easily be calculated that of the 35 ozs. of fat lost in the process of manufacture of butter on the scald cream system, 13 ozs. were recovered. The total weight of fat recovered as butter on the two tests being 5 lbs. 6½ ozs., we see that the loss of 35 ozs. is

considerable, being, in fact, 28 per cent. of the total fat present in the original milk. The following table summarises the results obtained, as set forth in detail in the preceding Report :—

SUMMARY OF RESULTS.

	FIRST TRIAL.				SECOND TRIAL.			
	Separator.	Jersey Creamer.	Shallow Pans.	Scald Cream.	Separator.	Jersey Creamer.	Shallow Pans.	Scald Cream.
	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.
Fat recovered as butter	3 3	2 13	2 15	2 12½	3 8	2 12½	3 2½	2 10
Fat in skim milk ..	3	9	6	8	4		8½	10
Fat lost in the process of manufacture ..	4	4	5	5½	4	1 3½	5½	12
Total fat dealt with	3 10	3 10	3 10	3 10	4 0	4 0	4 0	4 0
Percentage of total fat recovered .. .. .	88	77·5	81	76·5	87·5	69	78·5	65·6
Percentage of total fat lost .. .. .	12	22·5	19	23·5	12·5	31	21·5	34·4

TABLE showing COMPOSITION of the SAMPLES of BUTTER.

NUMBER.	FIRST TRIAL.				SECOND TRIAL.				See p. 205.
	Separator.	Jersey Creamer.	Shallow Pans.	Scald Cream.	Separator.	Jersey Creamer.	Shallow Pans.	Scald Cream.	
	1.	2.	3.	4.	5.	6.	7.	8.	9.
Water ..	11·06	12·00	13·27	18·78	15·33	13·44	12·05	17·54	18·49
Fat ..	87·41	85·40	84·39	78·27	82·70	84·70	86·02	79·32	80·19
Casein ..	·56	1·23	·87	1·31	·53	·40	·48	1·31	1·04
Salt ..	·97	1·37	1·47	1·64	1·44	1·46	1·45	1·83	·28
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

In attempting to draw any conclusions from the preceding results, care must be taken to fully allow for the very unfavourable conditions under which the trials were carried out. We are able to estimate only approximately the relative amounts of fat taken out of the milk by the various systems, for it is possible that, under more favourable conditions, all the systems other than the Separator would yield, with careful management in home dairies, better results than they did in the Showyard.

Next, the best butter and the maximum amount of butter can be obtained from cream only when it has been properly ripened, and the time and the conditions under which the work was done were neither favourable to the full or best ripening of the cream.

It is therefore satisfactory that the butter turned out so well as it did.

The opinion of those who tasted and kept the butter is unanimous in placing Nos. 2 and 3 at the end of the list as bad, and it is interesting to note that this is identical with the results of chemical analysis, which finds that of the raw cream butters these samples contain the largest proportion of casein. Of course, the scald cream butters contain more, but the reason of its not causing the butter to decompose is that "the organisms which cause decay are killed by the heat in scalding."

The serious loss of fat which takes place in making butter on the scald cream system needs further investigation.

It is evidently due partly to a loss of fat in the skim milk, which might be obviated were the best conditions as to temperature of setting, scalding, &c., more systematically studied.

But a larger loss is due to the custom of making up the butter with the hand, for the condition of the maker, and the temperature at which the operation takes place, can seldom be alike two days following. This is probably the cause of the great loss of fat in the Second Trial, and is likely to occur in any tests made by this method. The loss would be much smaller were the scald cream churned, and there is no reason to suppose the butter would be of less value. Careful tests should be made to settle these points.

There is yet another point of importance. It is not legitimate to leave 17 to 19 per cent. of water in butter, and a careful perusal of the Reports on the value and keeping quality of the samples shows very clearly that the more water present the less is the keeping quality of the butter, other things being equal.

Should any farmer, from reading this Report, determine to invest in a Separator, let him remember that while the Separator takes away more fat or cream from the milk, it also separates from the cream the ferments which promote ripening. Hence, separated cream takes a longer time to ripen than set cream. In the three other systems experimented with, the cream is exposed in thin layers to the atmosphere for a considerable time; this promotes proper ripening, while if the separated cream is put in a jar and very little air gets to it, an improper and injurious fermentation is likely to be set up.

Hence, while the Separator takes the most fat out of the milk, and is therefore the best cream raiser or extractor, it will not necessarily make the best butter, unless great skill and care are given to all subsequent operations.



5.—*How to make the most of the Cow in Winter.* By  
ALEXANDER POTTIE, M.R.C.V.S.\*

MANY of you may be doing very well with your cattle in winter while others, every bit as anxious to achieve success, are not quite satisfied, and possibly may not be able to give a satisfactory reason for what may be considered partial failure. If I put the question, How would you make the most of the dairycow in winter? the reply would be—Feed her well and keep her comfortable. That certainly is an answer, but the correct result would depend on the right meaning of these terms. I will confine my attention to the investigation of the following questions—What is a comfortable byre? what are the effects of a comfortable byre on milk cattle? and what loss is sustained if the byre is not comfortable? The word “comfort” is an elastic term, and may mean anything, therefore I take up the question the more readily because I observe farmers losing yearly considerable sums of money for want of a definite knowledge of the subject. I also observe a very great loss sustained, owing to the County Councils in Scotland—unwittingly, no doubt—enlarging the air space of byres, and therefore making it almost impossible to warm them in winter by the heat of the animals.

The fact that excessive heat and excessive cold cause the cattle to give less milk is well known; but each farmer or cow-keeper is left to himself to decide what is the best betwixt these two extremes for the cattle; and if you begin to question, you find the subject appears, to some at least, as of very little importance especially as County Councils favour the idea that too hot a byre is hurtful to the health of the cattle, and that fresh air is what is required. Now, whilst I own that good air is always desirable, I cannot see that moderately heated air is more dangerous to animals than cold; of the two, I should prefer the first. We must set aside all general ideas about the heat of the byre and comfort, and try what experiment reveals. Ask Nature the direct question, At what temperature should a byre be kept in order that the cow may give the greatest quantity of milk? Take any cow, feed her as you will, let her stand in a byre of certain temperature—say 50°—keep the heat at that point for a week, and see what is the quantity of milk you get from her. Try higher temperatures, and find out when she gives the greatest quantity, and is in the pink of perfection as to milk yield. If you arrive at this point you have the key to the whole question connected with health, air space

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\* Abstract of a Lecture to the Glasgow Agricultural Society.

milk supply, and profit; for you can then challenge any one to prove your cow is not in the best of health when milking at her best. As regards air space, if you cannot get your byre to this heat by the heat of the cattle, and you find it is the correct temperature, you can stop up the ventilators until you are satisfied. No veterinary surgeon can say that a cow is standing in a vitiated atmosphere, or that she is unhealthy, if she is at the pink of perfection in her production of milk. But some may doubt the existence of a perfect degree of heat. My first idea was to experiment on exact lines. I procured a thermometer, and commenced first with a small byre where there were only two cattle. I obtained some information, such as that it did not take many days to decrease the milk of a cow by lowering the temperature, but it took nearly double the number of days at a raised temperature to bring her to give the former quantity. I found that in the small byre the volume of heated air was too small to contend with the enormous volume of cold air outside, which was always seeking to change the byre temperature to its own, and, therefore, one could not get a steady temperature. Next year I had my arrangements more complete. I got a byre with nineteen cattle in it, and one which served well for keeping up the heat. Then I found an answer to my question.

In order to more fully understand the subject, let us see what science has to say before I tell you what the thermometer revealed. The farmer says a warm byre is necessary. This may mean, on a mild day,  $57^{\circ}$ , or, on a cold day,  $47^{\circ}$ . The members of the County Council maintain that pure air is what is required. What does the veterinary surgeon say? He has studied the cow minutely, has studied heat and its effects on animals; he knows heat in all its forms, and that every living animal possesses a certain degree of it above the medium it inhabits. The fish, although swimming in the coldest sea, maintains a heat above the temperature of water, and stands lowest in temperature amongst the cold-blooded creatures. The swallow stands highest amongst the warm-blooded animals; and where does the cow stand? Next to the swallow. The swallow migrates in winter to a warmer clime. So would the cow if at liberty, for while the blood-heat of the swallow is  $106^{\circ}$  to  $107^{\circ}$ , that of the cow is  $101^{\circ}$  to  $102^{\circ}$ , and of man  $98^{\circ}$ , so that you see the cow is fully  $3^{\circ}$  higher than man. Nature has adapted the cow for a warm climate. No doubt history traces her first to the plains of Egypt and China, tropical countries, suited to her temperature; but, although taken to a more northern region where long ago she has become acclimatised, that has not altered her heat  $1^{\circ}$ , for if we take her temperature in the

hottest or the coldest parts of the earth, it still remains the same,  $101^{\circ}$  to  $102^{\circ}$ . There are only three conditions I know of that can alter this temperature—age, disease, and death. You would expect, if you exercised her until she perspired, that then her temperature would rise, but it is quite the opposite. Her temperature would be decreasing. Now, there are two facts here worth observing—1st, that the cow's temperature in winter or summer, in heat or cold, does and must always remain the same while in health; 2nd, that this heat is fully  $3^{\circ}$  higher in the cow than in man.

This heat is kept up by a chemical process maintained by the food. It is probable that if the cow is kept in a byre the nearer it is to this fixed temperature, the less food she will require, but if kept at a higher or lower temperature, she will require more food. She has a wonderful arrangement for storing fuel in her body, for she has always a certain supply of fat, which is just the fuel she uses when the food is not sufficient. Now, the Ayrshire cow has not such a large storehouse for this fat as most other breeds, for the storehouse is the cellular tissue, or that white frothy tissue that connects the skin to the flesh, and this tissue is all made up of little cells that can either hold air, water, or fat. This house is very small in the Ayrshire, but her milk vessel is very active. Milk is the product you get from the cow, after all other organs of the body are satisfied. The stomach, lungs, kidneys, and skin must be satisfied before you get milk, and just in proportion as they are satisfied is this product, milk, yielded. The nerves of the skin are the agents watching the changes going on in the world, and the skin is a splendid thermometer. When any unfavourable circumstances occur, such as too great cold or heat, the agents communicate to the brain. The brain at once communicates to the manufactory—the udder—and less milk is manufactured. Thus daily and hourly communication is taking place. What, then, is the right temperature at which to keep my byre, in order that the cows may do their very best, and continue doing it? There are thousands of pounds annually lost for a want of this knowledge.

I have said already that this question cannot be solved without the thermometer. I experimented for two winters thus, not constantly but occasionally, and tried the experiments over and over again. Beginning with a byre of nineteen cattle at  $51^{\circ}$  and working upwards until we came to the largest milking of all, I arrived at  $63^{\circ}$ , and that, I hold, is the perfect temperature for a byre in winter. I went beyond  $63^{\circ}$ —to  $69^{\circ}$ —which was very difficult, in fact, almost impossible, to get in winter, but very

asy in spring when the outside temperature was at 51° or 55°. From 63° to 67° or 68° there was no perceptible difference in the quantity of milk, but about 69° it began to decline. At this higher temperature cattle sweat, and the workers in the byres complain of it being too hot; but at 63° I found few complaints, and that degree seems to me the perfect one. Not only does the cow give the most milk, but she seems to improve rapidly in condition, so that I am of opinion that this is probably the best temperature for fattening as well as milking. You may say if this is the perfect point, can you give us any marked proof that you have produced any good effect from your knowledge of the point? I unhesitatingly say yes, and from the following statements you may form an idea of the loss many of you are sustaining at the present time.

The first instance was one where I was compelled to prove my theory by practice. The facts were these—thirty cattle did fairly well from May till November; then the cattle were milking badly, and getting leaner and leaner. This went on until the bower stopped payment. The district was known to me to be an extremely cold one, and the bower seemed to be more disposed for fresh cold air than warm. This was causing the loss of milk, and the poverty was owing to too much liquid food. I raised the temperature of the byre, and in five weeks the cattle were giving nearly double the quantity of milk, and were getting in fair condition. Now, if I had not known beforehand the effect of 63° of temperature, I would not have undertaken this duty, for I used not a particle of medicine, nor very much extra food, but simply brought the byre to the correct temperature, and endeavoured to keep it there, for Nature does not like an unsteady temperature. But this is a mixed case—for food, or the condition in which the food was given, had something to do with it.

The next example is one of a model byre with all the latest improvements, but with a loft about sixteen feet from the ground, the boarding of the loft being taken off for three or four feet above the cattle in order to give plenty of air space. There were twenty-nine cattle in the byre, which were healthy and in very fair condition. The farmer said he could not satisfy them with food, and was, therefore, feeding heavier than ever he did, but this was not affecting the milk supply. I at once said that, in my opinion, the temperature was at fault. I found the temperature varying from 52° to 54°, and was told it was easily moved down. After the byre was brought to 63°, and kept for ten days near that temperature, we tested the next week, and found the net profit on the milk yield to be 2*l.* 1*9s.* 4*d.* The next week it came to 3*l.* 4*s.* 1*d.*,

and continued to vary from 2*l.* 18*s.* 2*d.* — the lowest — to 3*l.* 5*s.* 9*d.* — the highest.

Everyone who has put in practice what I have stated, has found a wonderful improvement in the milk yield and condition and health of the cattle in the winter.

Some may ask—What effect will this have on the cows when you come to put them out to grass? Will they not get colds? This is a point I have not omitted to notice, and am satisfied there is nothing in it. Before the 1st of May the temperature outside the byre is on some days 55° or 56°. The byre door and air passage are then thrown open, and the cattle begin to feel the spring heat, and are gradually accustomed to the summer temperature.

Another objection may be put forth by some who will say a byre kept at such a temperature cannot be healthy for the cattle nor for individuals. We would ask, Why, then, send invalids to Madeira, to Australia, and other warm countries, for no other reason than to escape our climate. Again, why is it that pit ponies remain so healthy and thrive so rapidly at this temperature in a dark pit? Yet these ponies are capable of performing more work, consume less food, and remain healthier than they would on the surface of the ground. When two or three cattle are standing together the heat of a wide area cannot be kept up. But twenty or thirty cattle could keep up the heat at 63° in an ordinary byre, and if a byre cannot be kept at this heat, I maintain it is not suitable for keeping cattle in during winter.

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#### 6.—*The Available Mineral Plant Food in Soils.*

ONE of the difficulties which agricultural chemists have for years had to contend against has been that of estimating the amount of food present in a soil in a condition which was available to the plant,—in other words, which the plant could feed upon. It has long been well known that many soils which upon analysis were found to contain fairly large quantities of, for example, phosphoric acid, would nevertheless give much larger crops if a small quantity of superphosphate were applied to them. Suppose the top nine inches of a soil were found upon analysis to contain 0.15 per cent. of phosphoric acid, there would be in that top layer of soil about two tons of phosphoric acid per acre, or as much as is contained in seventeen

tons of superphosphate. Nevertheless, upon such a soil the application of a few hundredweights of superphosphate would materially increase a swede crop.

Chemists have attempted to account for and explain this fact by the assumption that the phosphoric acid in the soil was not available to the plant, but that the phosphoric acid applied in the manure was available. Many attempts have been made to find some means of estimating the amount of this available phosphoric acid, as well as of the other constituents of a soil which are present in a form that the plant can utilise, for what has been said of phosphoric acid is equally true of potash and nitrogen, and numbers of other constituents.

The last contribution to this branch of agricultural chemistry is a paper which Dr. Bernard Dyer has contributed to the '*Journal of the Chemical Society*,' and at the meeting of the Society at which the paper was read, a long and important debate took place, in which Sir J. H. Gilbert, Mr. Warington, Dr. Voelcker, Mr. Lloyd, and other agricultural chemists, took part. As we think that some of the points raised may be of interest to our readers, we will attempt to briefly summarise the paper and discussion.

The late Dr. Voelcker had shown that, with the exception of nitrogen, all the substances which the farmer used as manure, although they were applied in a soluble state, were rendered insoluble in the soil. They do not come away in the drainage waters. It was therefore evident that the plant had some means of re-dissolving these substances. It was discovered very many years ago that the sap in the roots of plants was acid. So it became a generally accepted idea that the plant used this acid juice of its roots, as a means of dissolving and obtaining the mineral food it required. Several chemists were led to make analyses of soils upon new methods, and to try and determine in the laboratory what constituents the plants could obtain from a soil by means of this acid juice of their roots. But no definite method was generally adopted. Each analyst used a method of his own, so that the results of various chemists could not be compared.

Dr. Dyer determined to take up the question again. He commenced by determining the acidity of the root sap, so far as was possible, in a large number of plants, and found that it varied greatly, but had an average acidity equal to a solution containing 0.91 per cent. of citric acid. He determined to see whether, by acting upon soils of known composition with a solution having about the same acidity as the average acidity of the root sap of plants, he could obtain any insight into the question of what plant food was available, and what plant food

was not. For this purpose it was necessary to work upon soils about which something was known, and the value of his work is greatly due to the fact that Sir John Lawes and Sir H. Gilbert placed at his disposal a number of samples of the soils from their experimental fields at Rothamsted, the history of which was known for the past forty years. Working upon these soils, Dr. Dyer has shown that by means of a solution which represents more or less the acidity of the root sap of plants, it is possible to obtain far more information as to the amount of available mineral plant food in the soil than was obtained by the old system of analysis.

The President of the Chemical Society pointed out that the estimation of the available constituents of soils is a subject of the utmost importance, "not only as a means of arriving at estimates of the fertility of soils, but also in dealing with that other difficult question the value of unexhausted improvements."

Difficulties were pointed out by the various speakers, and there can be no doubt that some years will have to be devoted to further research before we can come to any definite understanding upon this question; but Dr. Dyer has opened up the question once more in a manner which is likely to ensure its being further investigated, and we may reasonably hope that very material benefit will accrue to the practical farmer from the ultimate results of this work.

But for the work done at Rothamsted and the great care and excellence with which these world-renowned experiments have been carried out by Sir John Lawes and Sir Henry Gilbert, it would have been impossible for Dr. Dyer's paper to have had more than a theoretical value. We see here how good work may prove valuable many years after it is done in a way that when it was done could not have been dreamed of by those who were undertaking it. Another illustration of this fact was well put by Sir Henry Gilbert in his speech on the paper. He mentioned how "two well-known agricultural chemists in Germany (Professor Hellriegel and Professor Maercker) finding that, in their capacity of consulting chemists in their respective districts, the analysis of soils as conducted in the ordinary way afforded them little or no guidance as to the advice to be given for their manuring, instituted an extensive series of vegetation experiments in pots, with a view to the elucidation of the subject." "It was of much interest to observe that it was in the course of these experiments, instituted with a totally different object, that Hellriegel first observed nodules on the roots of some of his leguminous plants, and, coincident, greatly increased luxuriance of growth. Thus, it is to the difficulties of soil-analysis, and the proper interpretation of the results, that we

we Hellriegel's investigations on the question of the fixation of free nitrogen."

Mr. Warington drew attention to some interesting points arising out of Dr. Dyer's paper. Thus the acidity of the root of mangel and beet was less than that of turnip and swede. But we know that mangels are well able to appropriate the combined phosphates of the soil, and stand in no need of phosphatic manure, while the turnip crop is of an exactly opposite character. It was also difficult to account for the potash which had been applied as manure on some of the experimental plots, for that potash was not found in the soil by analysis, nor was it accounted for in the crops. This was specially the case where farmyard manure had been applied. And Mr. Warington asked: "Has the large amount of decomposing organic matter on this plot kept the phosphoric acid, and specially the potash, in a soluble form, and carried them into the subsoil? Or has the silica of the straw helped to form insoluble compounds with the potash?" He thought these questions certainly called for investigation.

In fact, the paper opens up a wide field for future research, and it is to be hoped that some of our well-known agricultural chemists will follow up the subject in its many aspects.

Now the Bath and West and Southern Counties Society have for years been making most valuable field experiments as to the effect of various manures upon different crops. We hope that in the future, in conjunction with these experiments, there will be analyses of the soils upon which the experiments have been made, with the especial object of trying to determine how far chemical analysis can ascertain what substances the soils lack, as well as the effect of these manures when applied to the soils. Field experiments are of the utmost value, and if they can be carried out in conjunction with laboratory experiments, the Society may lend valuable assistance in helping to solve this most interesting and important question of how far the chemist may be able to estimate for the farmer the available mineral constituents in his soils.

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7.—*Some Preventable Diseases of Lambs.* By Professor  
WORTLEY AXE.

IN the breeding and rearing of all animals the health and growth of the young in the first period of life will depend to a great extent upon the health and vigour of the dam, and it is only by maintaining this at a high standard that sound robust



offspring can be assured. Too frequently the breeding ewes are made the scavengers of the farm, and compelled to pass through the trying period of pregnancy on the most scant and innutritious fare. The importance of the fact that the in-lamb ewe has to support herself and the one or two offspring which she carries during a long and bitter winter—often in bleak and exposed situations—does not appear to be realised by many sheep farmers. Nor do they appear to recognise the further fact that the growth and development of the lamb after birth will for some time depend exclusively on the nutritive resources of the dam. Thousands of lambs die annually owing to the ewe failing to meet the requirements of the offspring, in consequence of which these are driven by the pangs of hunger to partake too soon and too freely of artificial and other food-stuffs, on which their delicate digestive organs and as yet weak digestive juices are incapable of acting.

Frequently lambs are said to die from eating groundsel and other kinds of weeds, but it seldom occurs to the flockmaster to inquire why these plants have been consumed in poisonous quantities. An answer to this question would frequently be found in the attenuated forms and empty udders of the ewes. Again, the cause of outbreaks of destructive diarrhoea, attended with intense thirst, wasting, prostration, and convulsions, is found in the impoverished condition of the ewe, which is the only explanation of the disorder. To this state of the ewe flock may also be referred many of the accidents and diseases incidental to parturition, as well as those heavy losses which result when weakly lambs are overtaken by some parasitic or other disease, which a well-nourished animal would resist and survive. In view of the present scarcity of fodder and the impecunious condition of agriculture, the farmer has been sorely tempted and, in many instances, compelled to curtail the food ration all round, and, by so doing, to endanger the prospects of his breeding flock; while others have been led to indulge in the too free use of various extraneous matters, which, at best, can only be safely employed as supplementary to a reasonable allowance of fodder, corn, and cake.

#### JOINT-ILL.

Among the diseases which are of a preventable nature none is more fatal to the lamb flock than the infective malady, best known to shepherds as "joint-ill," and by them regarded as having some obscure connection with the "weather." For a long time practical veterinarians were wont to look upon this ailment as of rheumatic origin, and to attribute it to exposure to

easterly or north-easterly winds ; but the experience of recent years has shown it to be essentially connected with dirt—a filth disease, resulting from the passage into the body of “germs” or organisms connected with putrefying organic matter, such as would be furnished by dirty lambing pens or dirty shepherds.

To understand the manner in which this poison—for such it is—enters the system is of the first importance in the management of the breeding flock, and suggests at once the measures to be adopted in guarding lambs from its evil influence. In this connection it must be pointed out that, as in most other forms of blood-poisoning, so in this, the offending matter enters the body by means of a sore, or, in other words, the lamb becomes “inoculated.” In this instance, however, the wound is not of accidental origin, but one resulting from the natural breaking away of the “navel string” in the act of parturition. In weakly lambs, the healing process proceeds slowly, and not unfrequently what are termed by shepherds “sore navels” continue for days, discharging an offensive blood-stained fluid.

It is through this channel that the infecting matter enters the circulation, and, settling down in the joints and other organs of the body, excites in them inflammation and abscess. The offspring of old and young stock are alike affected ; but it must be admitted that the lambs of ewe tegs suffer much more frequently and severely than those of older sheep. The reason of this may possibly be found in the fact that the offspring of the latter are usually better nourished than are those of the former, and consequently better able to repel and withstand the disease. Twins are more often affected than singles, and the weakly than the strong. Debility and exposure are undoubtedly predisposing causes.

Stiffness and lameness, attended with enlargement of the joints—especially the knees, hocks, and stifles—are the most striking indications of the disease ; but in the course of an outbreak many lambs succumb to abscesses in the liver and lungs, without showing any derangement of the organs of locomotion. The losses from this disease are rarely less than 40 per cent., and we have known them to reach as much as 80. Few of the affected animals entirely recover from the disease, and such as do seldom prove remunerative stock to keep.

With regard to measures of prevention, the first necessity is that the food of the ewes should be sound and wholesome, and supplied with a generous hand. The employment of decomposing roots should be strictly provided against, and the lambs should have reasonable protection from wet and cold. It then only remains to see that the lambing pens be kept clean and cool, and the hands and outer garments of the shepherd freely

disinfected. It must be remembered that the litter of the pens, unless renewed from time to time, becomes fouled by the discharges of the cleansing ewes, and the ground beneath it is soon saturated with putrefying animal matter of a distinctly infective character. In case of an outbreak of the disease, the assistance and advice of a veterinary surgeon is imperatively called for; but the flockmaster should understand that the lambing fold must be at once abandoned, and fresh pens erected in some other part of the farm for the healthy portion of the flock. The old fold must undergo a thorough cleansing, when it may afford shelter to the animals already affected and those which may later on suffer from the disease. All lambs born after the first appearance of the disease in the flock should have their navels dressed twice a day for the first three or four days with a solution of carbolised oil, and, until turned loose, must be folded on clean dry litter. The ewes should be supplied with a liberal ration of manger food, and a moderate but not excessive quantity of sound roots.

#### GID—TURNSICK.

Of the many diseases which threaten lamb life, none occasion such serious and widespread losses as do those resulting from parasites, and although our knowledge of the life-history of many of these creatures is too scanty to enable us to prescribe reliable measures of prevention, there are others whose habits and *habitat* are so well known that anyone who will take the trouble may do much to guard against their destructive effects. The fatal disease termed by shepherds "gid" or "turnsick" falls under this category. Here the malady is induced by an organism commonly termed a "bladder-worm," but technically known as the *cœnurus cerebralis*. This creature consists of a thin-walled sac, filled with water, and having upon it a number of small white excrescences of the size of a mustard seed. These little outgrowths are in reality the heads of future tapeworms, so that the so-called bladder-worm represents a mere stage in tapeworm development—not of one tapeworm, but of many, for each little head represents the starting-point in the growth of a separate individual. During the bladder-worm period of its existence this creature occupies the brain of the lamb, while in its tapeworm condition it is found in the bowels of the dog. Its life, therefore, is spent partly in one animal and partly in the other.

To understand the measures of prevention of gid the farmer requires to know something of the manner in which this parasite is transferred from the sheep to the dog, and back again from

he dog to the sheep. In this connection, then, it must be observed that dogs suffering from a particular tapeworm—the *tania cænurus*—discharge with their excrement small white flat egg-bearing segments. These, if voided on pasture land or on roots, or other description of food, are eaten by lambs. On reaching the digestive canal there escape from the tapeworm eggs small microscopic creatures armed with six hooklets, by which they are enabled to bore their way through the tissues of the bowel, and ultimately to reach the brain, in the substance of which they take up their abode, and soon develop into bladder-worms. As they grow, the brain at first suffers from irritation, and later on becomes seriously pressed upon and disorganised, resulting in the giddiness and paralysis which are the main features of the disease. If, on the death of the affected lamb, the infested brain be consumed by a dog, then the bladder-worms, on reaching the intestines of that animal, develop into tapeworms. These in the course of time scatter their egg-bearing segments, with the same possible result as before.

In order to guard against the propagation of this parasite and the induction of gid, dogs having tapeworms should not be allowed at large, but so soon as their condition is known, suitable medicines should be administered to cause their expulsion. It frequently requires two or three doses of worm medicine to effect a complete clearance of the pest; under these circumstances, dog's excrement, therefore, should be carefully watched from day to day, and until segments of the worm cease to be passed he must be kept in confinement. While this is going on all the faecal discharges from the dog, and the worms which accompany them, must be burnt. It unfortunately happens that farms sometimes become infected by stray dogs and by hounds passing over them, in which case the farmer is helpless. In these days of agricultural depression, masters of hounds should recognise the responsibility which in this connection attaches to sport, and keep their pack as free from these parasites as possible. A good deal might be done in this direction by forbidding the use of sheep's heads as food for hounds. This, however, would not be necessary if farmers would take the precaution to burn or otherwise destroy the heads of lambs having died of the disease.

Where the malady already exists, treatment is of little avail, and so soon as its presence is made known, the most economical course to pursue is to destroy the affected lambs, and burn their heads, as already recommended.

## PARASITIC DIARRHOEA.

Diarrhoea resulting from the presence of worms is mainly to two kinds of parasites, one of which (*strongylus col*) infests the true stomach, and the other (*trichocephalus a*) round in the large bowel. Of the two, the former are the mischievous and fatal in their effects. They are blood-suckers and cause a considerable amount of gastric irritation, and derange the digestive function. In a recent outbreak of the kind investigated in Kent it was estimated that the stomachs contained no less than 5000 strongyles, all of which, could the animal have lived, would have sooner or later been so over pastures.

The life-history of these parasites is not so clearly marked as in the case of the gill organism, but, according to Raill, embryos of the *strongylus contortus* "will not develop in water, but die in the course of a few weeks." "Leuckart seen them grow rapidly in muddy water, however, and after several moultings or shedding of the outer skin, reach a stage of development in which they were capable of being completely perfected in ruminants." Our own experience tends to confirm the view that the young of the *strongylus contortus* are often killed by lambs drinking from dirty ponds and ditches and stagnant water of boggy places, but we have also on several occasions known it propagated by the dressing of pastures with the mud of ponds. This was the case in the outbreak just referred to. In dry seasons, when ponds and water are low, the chances of infection are much increased by a lamb walking into them and stirring up the mud, and with parasites contained in it.

As a matter of prevention, therefore, lambs should not be pastured on boggy land; ponds and ditches should be regularly cleansed, and further security might be obtained by fencing them so as to prevent the entrance of stock and the disturbance of the mud, or if a sound bottom of stones, or rubble were made at the "drinking-place." — *Liverpool Journal*.

*8.—Publications of the Board of Agriculture.*

The following is a list of the leaflets published by the Board of Agriculture during the year 1893, any of which may be obtained free of charge from the Secretary to the Board by farmers who are specially interested in the subject treated :—

- | 1893. | <i>Title.</i>                                      |
|-------|--|
| A 1.  | The Black Currant Mite ( <i>Phytoptus ribis</i> ). |
| A 2.  | Farmers and the Income Tax.                        |
| A 3.  | Cultivation of Osiers.                             |
| A 4.  | Insects on Fruit Trees.                            |
| A 5.  | The Mangold Wurzel Fly.                            |
| A 6.  | The Field Vole and its Natural Enemies.            |
| A 7.  | Autumn Catch Crops and Fodder Supply.              |
| A 8.  | Farmers and Assessments to Local Rates.            |
| A 9.  | Ensilage.  |
| A 10. | The Ribbon-Footed Corn-Fly.                        |
| A 11. | Anthrax.   |
| A 12. | The Gooseberry Saw-Fly.                            |
| A 13. | Acorn Poisoning.                                   |
| A 14. | The Raspberry Moth.                                |
| A 15. | The Apple Blossom Weevil.                          |
| A 16. | The Apple Sucker.                                  |
| A 17. | Preservation of Commons.                           |
| A 18. | Fertilisers and Feeding Stuffs Act, 1893.          |

The following Reports have also been published, and can be purchased from Messrs. Eyre & Spottiswoode :—

- On Insects and Fungi Injurious to Crops.
- On the Distribution of Grants for Agricultural Education in Great Britain.
- On Corn Price Statistics.
- On Further Experiments in Checking Potato Disease.
- Of Proceedings under Inclosures and other Acts.
- On Field Voles (Scotland).
- On Rust or Mildew on Wheat Plants.
- On Contagious Diseases of Animals.
- On Cattle from Canada (Correspondence).
- Produce Statistics of Great Britain.
- Agricultural Returns of Great Britain.

In addition to the above, all of which can be obtained, the Board of Agriculture, with the sanction of the Treasury, made arrangements for the reproduction in nine volumes of the complete series of memoirs of the Rothamsted Experiments of Sir John Lawes and Sir Henry Gilbert, with a view to these valuable records being placed in the Libraries of some of the more important Institutions engaged in imparting Agricultural Instruction in Great Britain.

The Bath and West and Southern Counties Society have been presented by the Board of Agriculture with one of these sets, and the volumes may be consulted by Members of the Society at the Offices.

The set comprise three quarto and six octavo handsomely bound volumes, and it is not possible to examine these without realising the enormous amount of work—the value of which cannot adequately be estimated by any contemporary—which has been done by these eminent agricultural experimenters, nor without feeling a deep sense of gratitude to the Board of Agriculture for having placed this store of information within ready access of every Member of the Society, indeed, of the Agricultural Community.

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## Short Notes.

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### Scald Cream v. Separator.

Speaking at the classes in connection with the Bath and West and Southern Counties Society's Dairy School at Crediton, Sir John Shelleys said he had, during the time the classes were held, made experiments from his own produce at Bradley Farm. On January 10th he divided in half his morning's and evening's milk. 90 lbs. 10 ozs. by weight of milk was sent to the School and separated, while the same weight was kept at home and scalded. The butter produced by the separator weighed 3 lbs. 8½ ozs., and by the scald process at home 2 lbs. 13 ozs., both creams being worked at the same time. This was a gain of 11½ ozs., or of 25 per cent. in favour of the separator. On January 17th he made a further experiment, when 66 lbs. 10 ozs. of milk was sent to the School to be separated, and the same quantity kept at home and scalded. On the 19th it was churned, with the result that at the School 2 lbs. 10½ ozs. was produced, as against 2 lbs. 1½ ozs. from the scald cream, or a gain of 9 ozs., being 27 per cent. in favour of the separating process. After this the milk from the scalded cream was passed through the separator, and cream obtained, which, mixed with the butter-milk from the scalded cream, was then churned, and produced 6½ ozs. of butter. This was a result which he strongly wished to lay before them, and whilst not desiring to do away with the local way of making butter, he at the same time wished to point out the gain which might be obtained by the use of the separator and churn, while by their use greater cleanliness would also be obtained.—*Agricultural Gazette*.

### Mangold.

We have grown good crops of mangold in clay soils, and in a great variety of mixed soils, as well as in light loams, and even sands. It is usually said that mangolds require better land than turnips or swedes, and we certainly should not attempt to grow them in the poorer classes of soils, not because they would not yield with high farming as heavy a crop as any other kind of root crop, but because their removal from such land leaves it too much exhausted for a profitable corn crop to follow. The common saying, that roots are renovating crops and corn the contrary, is not quite correct. Roots have no special power, like clover, of collecting nitrogen from the air by their leaves, or of obtaining it from the sub-soil by their roots. But a good crop of roots removes from the soil a great deal more plant food than a good crop of corn, 14 tons of swedes removing 74 lbs. of nitrogen, while 30 bushels of wheat remove only 33 lbs. Roots, therefore, rapidly exhaust the soil of its available plant food, and they have no claim to be called renovators unless they are consumed on the land, which is not usually the case with mangolds.

The worst that can be said of this most useful crop is that it may, under



certain conditions, prove exhaustive in the particular field in which it is grown. It is possible that the proposition may be disputed by those who have found that a heavy crop of mangold leaves the land richer than it was before the crop was taken, and in better order for the following crop of corn. This is undoubtedly the case on highly farmed land, and we offer a contrary experience as being exceptional and applying to poor land in poor order, capable of yielding in its present condition not more than from 15 to 20 tons of mangold per acre. It will generally prove more profitable to aim at 40 tons per acre; and then the crop, having been better farmed, will not be found exhausting. It is one of the advantages of growing this crop that it proves far more responsive to dressings of nitrate of soda than other root crops. At present most of the nitrate of soda used in agriculture is applied to the corn crops; and its value as a dressing for mangold does not appear to be sufficiently recognised. It was used as a top dressing for mangold thirty years ago, to our knowledge, by a few intelligent farmers who had discovered the secret of its success, and who always excelled their neighbours in the weight of the crop, without finding cause to complain of the crop that followed. A tradition prevailed that this manure was not a substantial pabulum for the plant, but only a stimulant which had the effect of spurring the crop rather than feeding it. It is quite possible that heavy dressings of nitrate on land in poor condition may increase its poverty. But the same may be said of any other manure which contains only one constituent of plant food. It is not a compound manure, carefully prepared so as to supply all the elements required by the crop, and it should be used therefore with the addition of dung or some other manure supplying its deficiencies.

Unless a heavy dressing of nitrate is distributed in successive sowings, the plants are liable to run to seed, maturing prematurely under the influence of too much concentrated food. The plan of adding the manure in successive doses will have the effect of securing a more prolonged and healthful growth, when "bolting" will not happen. When the seed is sown in the flat, the drill should be fitted with a fertiliser attachment, and the manure drilled at the same time as the seed. If it is sown in ridges, the nitrate may be sown immediately before the ridges are formed, when most of it will be gathered under the side, beneath the seed. Those cultivators who use salt usually sow it as just described, when it takes the surface less than if it be sown at top. The usual dressing is 3 cwt. to 4 cwt. per acre. It need hardly be added that the solubility of nitrate of soda renders it very liable to be washed into the drains or subsoil, and lost, which forms a sufficient reason for its careful application in the manner just described.

We recommend strongly that the distance of the plants apart should be moderate. Unless the rows are kept a yard apart for the sake of cleaning the land by ploughing between, which may be expedient in the case of foul land, we should strongly recommend 27 to 30 inches as the best distance from row to row, the plants to be singled 15 to 18 inches distant from one another. It will be understood that this advice is based on a fact well known to chemists, and recognised now by most farmers, that roots of moderate size are of higher value than those which are overgrown.—*The Field*.

#### **Poultry Feeding. R. WARRINGTON.**

The very large proportion of nitrogenous matter contained in eggs, and the immense production of eggs which takes place in the laying season, prove the

necessity of supplying laying hens with an abundance of nitrogenous food when they are debarred from seeking their natural food of insects, worms, &c. The most suitable diet for the production of a large number of eggs has recently been made the subject of investigation, both at the Government Experiment Farm at Ottawa, and at the two New York experiment stations at Geneva and Cornell. Each of these investigations brings to light important facts, but the question becomes clear only when we bring all these facts together.

At Cornell two diets were employed. One diet supplying little nitrogen consisted entirely of maize, used in the form of "cracked corn," and "corn dough." The other, a nitrogenous diet, was a mixture of equal parts cotton seed meal, wheat bran, and wheat shorts,\* soaked with two parts of skim milk. The hens used were Plymouth Rocks, a large American breed. Both lots received throughout the trial a little green clover or cabbage. The hens fed with the nitrogenous food laid seventy-nine eggs, while those fed with maize laid only twenty-six eggs in the same time; the nitrogenous diet thus proved very favourable to egg production. But it was an unwholesome diet, as the eggs were of bad quality; while the few eggs obtained by feeding with maize were, on the other hand, excellent.

At Geneva, a trial of two diets was continued for two years, first with pullets, and afterwards with the same birds as hens. The diets were by no means so extreme as those just mentioned. The more nitrogenous diet was a mixture of oats, oatmeal, maize, linseed meal and bran, with maize silage, or clover, and sometimes meat scraps. The less nitrogenous diet was a mixture of maize meal, maize and oats, with the green food, and occasional meat scraps already mentioned. Each diet was tried on two lots of hens, one lot a mixture of large breeds—Plymouth Rock, Brahma, and Cochin; the other lot a mixture of two small breeds—Leghorn and Polish.

The birds receiving the more nitrogenous diet presented the most healthy appearance; their plumage was more full and glossy, they were freer from sickness, and did not attempt to eat either eggs or feathers, a vice which appeared among the fowls having the less nitrogenous food.

In the first season's trial with pullets those of the larger breeds gave the largest number of eggs when fed with the more nitrogenous diet. But, very curiously, during both the first and second season, the less nitrogenous diet yielded a far better return in eggs from the smaller breeds, the average per hen being 68, as against 43 with the more nitrogenous food. On the other hand, the larger breeds yield better, with the more nitrogenous food, during the months of most active production, though on the whole year, the difference between the two diets was very small. The different effect of the same diet on various breeds was thus plainly shown. It will be recollected that the profitable result obtained with a very nitrogenous diet at Cornell was in the case of a large breed, a result thus agreeing with that obtained at Geneva.

The experiments at Ottawa were upon the production of eggs during the winter months. Many breeds were tried, both as hens and pullets. At first the same liberal diet was given to all, it not being a special object of the experiment to compare a nitrogenous with a less nitrogenous diet. It soon, however, appeared

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\* Wheat shorts are derived from an exterior layer of the grain beneath that furnishing bran; they are thus similar to the English pollard and sharps.

that different breeds were quite differently affected by the same diet, that, the stimulating and fattening foods which go to eggs in the case of Leghorns, Minorcas, Spanish, and Hamburgs, make Brahmas, Cochins, Langshans, Plymouth Rocks, and Wyandottes so fat, as to lay soft-shelled eggs, or not to lay at all. The recommendations as to the most suitable diet for these two classes of fowls allots the heavier breeds a more nitrogenous diet, in which ground oats and bran take the place, more or less, of maize and wheat, and occasionally of potatoes, and a less nitrogenous diet for laying pullets. A ration which would go to eggs in the pullets is likely to make hens too fat to lay.

The conclusions arrived at in Canada thus confirm and illustrate the facts observed in the United States, but that small breeds should do best with a less nitrogenous diet than large breeds is certainly remarkable.

The best nitrogenous foods for laying hens are apparently meat, oatmeal, and pollard or sharps; little success seems to have attended the use of oilcakes or leguminous grains. Skim milk has been very successfully used as a food for young chickens, and it would doubtless also answer with older birds. Nitrogenous food is especially demanded at the time of moulting.

The same diets used at the Cornell Station for laying hens were given at the same time to chickens six weeks old. The more nitrogenous diet proved much the best. After four months, the five chickens receiving this diet had gained nearly 9 lbs. in weight, while those fed chiefly on maize had gained but 3½ lbs.

The large amount of lime required to produce the egg-shell is well known. At the Geneva Station an attempt was made to obtain experimental proof that the powdered oyster-shells supplied to the hens were actually digested by them. The quantity of lime in the food and in the eggs produced was ascertained by chemical analysis, and it was conclusively shown that the lime of the egg-shells had been derived from the oyster-shells supplied. Any soft limestone will answer for this purpose; hens should never be without a supply of such material.

At the same station it has been customary to mix a small quantity of common salt with the food of laying hens. The amount should not exceed 1 oz. per day for 100 fully-grown hens, and the salt should be well mixed with the food, so that no bird may obtain an injurious quantity.—*Agricultural Gazette*.

#### Potatoes for Pigs. W. G. N.

The pig is the universal scavenger of the farm, and utilises, and, if properly attended to, turns to profit, the waste products, whether of the dairy, the house, or the fields. Too often, however, he is not properly attended to, and thus not infrequently, instead of making a profit out of what otherwise would be wasted, he consumes in addition thereto more costly food than he can pay for, either at market or when killed for home consumption. It is how best to assist him to utilise this waste, and, by providing food at a cheap rate, enable him to be fed to a profit, that is the subject of this paper, and I venture to suggest that this will be most readily effected by the growth of special crops for the consumption of the pigs, in like manner as special crops are grown for the sheep flocks and cattle herds. One frequent source of loss in pig-feeding is the lavish use of corn and meal, and although the pig cannot be fed satisfactorily without a certain proportion of this high priced food, it will be found that where there is a regular supply of

oots and green crops in season to supplement the waste products of the house or lairy, and to take the place of these when not available, much less corn and meal will be necessary, and the pigs can be grown to pork or bacon at much less cost than by the other system of feeding.

In the production of special crops for pig-feeding I will glance at green crops for cutting first. Of these, vetches, grown freely and cut while still quite young and succulent, form a food that is very highly appreciated.

Red clover in spring, or as long as it is sappy and tender, is another capital green crop for the purpose.

Perhaps, however, where conditions are suitable, and a ready supply of water or liquid manure is available, Italian ryegrass is about the most satisfactory green crop to grow for pigs. All three of these crops will be found great aids to profitable feeding, but it is to the root crops more especially that we must look for the sources of our cheapest pig meat, and first and foremost of all special crops, whether root or green, stands the potato.

Some may smile at the idea of growing potatoes for the purpose of pig-feeding, but I am convinced that potatoes at 20s. per ton are as cheap pig-feed as can possibly be procured, and that no mixture is so economical, and conducive to healthy growth as that which includes a proportion of cooked potatoes.

Twenty shillings per ton is a fair average estimate of the cost of growing them under any ordinary conditions, and it must not be forgotten that in growing this root for feeding purposes the coarser and free-cropping varieties most suitable to the district would be selected, while if grown upon black sandy soil, where the best kinds are of inferior quality for the table, these would, with good culture, give a large yield. And there is one advantage in potato culture, that if such a field as described is included in a farm, it will, with farmyard manure, bring a crop of potatoes for several years in succession, however ill-adapted it may be for the production of other root crops.

A continuous supply for every month in the year of this tuber can be readily provided. Taking Beauty of Hebron, for example, as a free-growing second early, ready for use in August, this may be followed by Emperor, White Elephant, or Fidler's Reading Giant for main crops, all giving large yields, though one, at least, is an edible potato of considerable excellence, with Sutton's Red-skin Flourball, which keeps readily to August again for late use. Thus a supply for every day in the year may be arranged for, though these kinds are only referred to as types of the varieties to be planted, and possibly in some districts might with advantage give place to others.

A ton of potatoes will furnish a pig with half-a-peck, or 10 lbs., of good food per day for over seven months, and, as for the first five or six weeks of a pig's existence he lives almost entirely on his dam, a ton of potatoes would suffice to form a basis of his food till about nine months old, by which time he should be quite fit to kill as a baconer; while, for pork, two or three months earlier should see him ready for the butcher. Thus 1d. per day in the one case, and considerably less than this in the other, would be the cost of this portion of his diet.

All potatoes should be cooked—steamed for preference—and, when they are so cooked and thoroughly mashed up with any liquid (even cold water) and a little meal added, pigs eat the mixture with the greatest avidity, and grow apace. Of course, where readily obtainable, dairy wash is a great and valuable addition, whether as sweet whey, or, better still, separated milk, their value

being much greater when given as adjuncts to other food, such as a mixture of cooked roots and ground corn, than when given by themselves, which always appears to be a very wasteful method of feeding.—*Live Stock Journal*.

### **Winter Keep.**

One of the principal requisites for successful farming is the habit of looking ahead. When the greatest economy is necessary, as it is to enable a farmer to make both ends meet, one of the greatest questions—a question, moreover, which is very difficult of solution—is the most economical way in which to feed out, or keep in a healthy, growing condition, the live stock of the farm through a long and perchance a hard winter. The high prices which beef and mutton made some years ago, together with the gradually declining prices of corn, caused many strong land farmers to grow an increased acreage of turnips, whilst the rapidly lowering price of beans caused that crop to be neglected, and the acreage has been decreasing year by year. Yet, as a forage plant on many farms, beans may, with advantage, take the place of turnips—an expensive crop to cultivate under favourable circumstances, and especially so on strong clays. Indeed, on land of this kind, beans have the advantage over turnips in every way. Properly managed, beans are as good a cleaning crop as turnips; they are more easily sown, more easily kept clean, more easily harvested, and their feeding value is of a much higher character. All the more reason, therefore, why beans should be cultivated on the strong lands of the north, as was the case in the days of our forefathers.

That the principal leguminous crops grown on English farms have been greatly neglected, there is no gainsaying. The acreage under other crops has also decreased, but in a proportionately less degree than the acreage under beans and peas, whilst there has been no corresponding increase in the growth of vetches, tares, and similar green crops. During the last thirteen years the area under turnips has decreased by 180,505 acres, out of nearly 3,000,000 acres under that crop in 1850. But during the same period the area under beans and peas has decreased by 155,403 acres, out of a total acreage of 660,000. That this is a distinct loss to the agricultural community, or to a very important part of it, there can be little doubt, and that more land should be sown with beans seems very desirable. And here we would say that we prefer the bean to the kindred crops of peas, tares, or any variety of the vetch. Its upright habit renders later and consequently more frequent horse hoeings possible, a circumstance of great importance. It should also be borne in mind that the cost of thoroughly cultivating land for beans is much less than the cost of cultivating strong land for turnips, which seems an additional reason for growing the former on suitable land.

Having grown the beans, then comes the question of the most economical way of using them as forage. In the good old days when beans were dear, it was customary to give them in the form of meal, and the straw was, in many farms, looked upon as of little value; yet even in those days some shrewd old farmers used to give their milking cows "bean sheaf." This was a wasteful and extravagant way of feeding the beans. To get the greatest possible amount of feeding property out of beans, it is necessary that they should be cut before they are ripe. When the outer skin of the bean is just formed, but before the leaf

begins to fall, is the best time. This necessarily entails what is known as a great deal of "field room," but with beans that is a matter of minor importance, as they do not suffer at all from occasional showers after being cut, and even heavy rain, unless it be long continued, does not cause much appreciable damage. Care must be taken not to lead too early, or they will not "cure" properly, and then some of their nutritive properties are lost. They should not be thrashed, but the sheaf should be chopped, and the chop mixed with linseed cake. Cattle, especially cows, will be found to do better than they will on turnips and the like quantity of cake.

The principal reason why we prefer beans to peas or vetches is that they enable the land to be so thoroughly well cleaned. If drilled a sufficient width, a second horse hoeing can always be given them, and one or two good hand hoeings can be managed long after it is impossible to get a horse amongst them. This the trailing habit of peas and vetches prevents, and it must not be lost sight of that if beans are to take a prominent place in a clay farm rotation, they must be treated as a fallow crop. That turnips should be displaced by beans on strong farms is by no means the argument, but experience has proved that on most strong clay farms fewer turnips and more beans might be grown with great economical advantages.—*The Field*.

#### **The Washing of Butter.** J. P. SHELDON.

On this subject there has been some interesting discussion. There is usually room for discussion on so moot a point, or room can be made if there isn't. There are still persons who refuse to wash butter at any time of the year; it is, in fact, their settled practice not to wash it. In almost everything, much depends on when and the way it is done.

What is the object of washing butter? To remove all the caseous matter from it. And why is it desirable to remove the casein? Because the casein does not keep very long, and, in fact, is not butter at all. It may be said in retort that water is not butter at all, and yet all butter contains more or less water. Well, this cannot be helped, but the other can, and one intruder is better than two. In butter for early consumption the casein is not particularly objectionable, especially in winter. Some say it imparts a piquancy to the flavour of butter. So it may, but it seems to me that butter needs no flavour other than its own. The flavour of butter is one thing, and that of casein another. Butter fat is the most desirable constituent of milk—the most delightfully aromatic—and altogether the best. Butter no doubt improves the flavour of casein, for cheese is poor stuff without it, but it is not at all likely that casein can possibly do butter any good. This will be obvious to anyone who tastes the two separately—butter without casein, and casein without butter. Another test is this: Take out one lot of butter from the churn without washing, and wash the remainder; then place them side by side, and note the difference in appearance and aroma. The difference in the aroma will be all the greater if the cream were sour; and in this case the greater the benefit of washing. There is reason in not washing butter from fresh cream—the casein may help to develop the flavour; but butter from ripened cream will have flavour enough without. There are two ways of washing butter as of doing anything else—a right and a wrong way. If the water be poured violently into the churn, and the churn rashly revolved, no doubt the

butter may be injured in the washing. This, indeed, it is that has caused some persons to condemn washing. But do they ask themselves if they are justified in condemning the washing when it was really the washer who was in fault?

Butter taken at the right moment—just when it is in granules no bigger than mustard-seed—and washed with care in several waters, will be lovely to look at when it comes out of the churn. The water, however, must be pure and cool, and be poured in so as not to fall roughly on the butter—poured down the wood, or through a pipe to the bottom. What is wanted is that the water should lift up the butter, just as the rising tide has floated a boat that was lying on the beach of the sea, and the butter should float gently while it is washed by the water. Washing like this certainly improves the butter. Butter may easily be overwashed, we know, or it may be underwashed. No thoughtful dairymaid needs to be told of this. Better, indeed, not to wash the butter at all than to overwash it. Washed in the churn, whilst still in a granular condition, the butter is entirely dissociated from the casein, and so it will keep fresh the longer. Butter, indeed, is washed to improve its keeping properties, or, at all events, chiefly with this object. Therefore, the process of washing is more desirable and necessary in summer than in winter, because in winter the butter will keep long enough, even if it has not been washed. However, washing needs no justification beyond this, viz., the butter is altogether a pleasanter article of food if all the casein has been removed from it. The casein can only be removed thoroughly whilst the butter is in a granular state, and nothing but washing, and washing at the right time, can relieve the butter of *all* its casein.—*Farm, Field, and Fireside.*

#### **Fermentation.** M. J. R. DUNSTAN.

Many manufactures, such as beer, spirit, and cheese-making, depend upon fermentation, which is a chemical change induced by living organisms introduced into substances, such as wort or milk, and resulting in the formation of spirit or curd. In the case of beer, the sugar in the malt is, by means of an organism or ferment known as yeast, changed to alcohol. Now, ordinary brewer's yeast does not consist of only one kind of organism, but of a great many different kinds, some of which exert a beneficial action, others a detrimental action, and according to the preponderance of one or other yeast the fermentation is successful or not. To ensure success under all circumstances in such a fermentation it is of course essential that only those organisms should be introduced whose action results in the correct fermentation, and by the treatment of ordinary or impure yeast in a certain manner, so as to foster the growth of the well-disposed organisms, and destroy the useless or harmless ones, a culture has been obtained of only those organisms whose action results in a correct fermentation, so that when proper precautions are taken and the purified yeast used, nothing but a successful fermentation can result. Applying this principle to the process of souring cream before churning, we can arrive at a similar result. There is no possible doubt as to the fact that a great portion of the bad butter made results from imperfect or improper souring of the cream. The organisms present in the air of a dairy are of many kinds, and cream allowed to stand and sour in the air will absorb and become a breeding-ground of countless species, some of which will exert an influence for good, and others for bad; consequently, it is a matter of chance how the

butter from such a sample of cream turns out. The same chance result occurs when a quantity of sour cream or butter-milk is added to the cream before churning, though here, of course, if proper precautions are taken the conditions may be more under control. The use of these cultures of organisms, which contain only those whose action can result in a proper souring, is intended to remove all chance of failure, and if care be taken as to cleanliness in the dairy, the fermentation can be made to proceed on perfectly definite lines. It has often been remarked, and cannot be too often brought before the notice of dairymen, that fresh milk is most ready to take up germs of all descriptions, and too much care cannot be taken of the atmosphere to which milk is exposed; muslin coverings to the windows act as a fairly efficient stop-gap to germs from the outer air, and if the proper kind of germs can only be induced to teem in a dairy, and strict attention is paid to cleanliness of all vessels used, and of all operations connected with milking, the chances of harmful germs finding a resting-place are of course diminished.—*Agricultural Gazette*.

#### In praise of Welsh Cattle.

Some local breeds are, for their own country, quite indispensable. No doubt breeds, of no little repute a century ago, have completely died out; others are distinctly on the wane, and seem as if doomed to extinction. The Gloucesters and Glamorgans and the sheeted cattle of Somerset are gone, and the once renowned Longhorns are fast disappearing; whilst the old British white cattle may be said to hold a precarious position.

Great progress in breeding has been made within the century; and, on the whole, there is little to regret in the loss of a few old types. Yet it would be disastrous if all our local breeds of cattle should be supplanted by one uniform kind. The event is not, however, likely to take place while our country is so diversified in soil, climate, and geographical features as it is. The strongest characteristic of our agriculture is its diversity—we have our special wheat, barley, and oat districts, our half dozen breeds of horses, a dozen breeds of cattle, and our many breeds of sheep and pigs. Although Shorthorns—in size, early maturity, and aptitude to fatten—are in the first rank among cattle, and have the greatest range of adaptability to soils and climates at home and abroad, some other breeds will continue to hold their own as being most suitable to the districts in which they have been bred for ages. This is particularly the case where distinct breeds of hardy cattle occupy poor pastures and exposed positions. The West Highlands are not likely to be supplanted on the mountainous districts of Scotland, which have been their home for centuries; the hardy diminutive Kerry will survive in Ireland; and the black cattle in stormy, wet, and wild Western Wales. These breeds deserve to be encouraged and improved rather than condemned. They have their special place in the general agriculture of our country.

For the ordinary tenant farmers in the counties of Pembroke, Cardigan, and Carmarthen, no cattle are better suited than the native blacks. They are excellent graziers, feed well in the stall, withstand cold and wet with great hardihood of constitution, and withal the cows are fairly good milkers. The counties mentioned are stock-breeding and not corn-growing districts. The tenant farmers are, as a rule, badly provided with sheds; so they breed cattle



which require but little shelter, and which, if needs be, will thrive and grow fat on good pasture in the open fields during winter. They are helped with a little grain, whole or crushed, or ground into meal, with a small feed of hay night and morning.

Then, again, the native cattle of a district are always in demand at local fairs—especially as stores. Many of the farmers of South Wales are compelled to get rid of a few stores; others sell their young oxen in May, June, or July in a half fat condition. In either case they fetch £2 more per head than do coloured cattle of a like class. The local purchasers, in search of store stock, prefer the local breed; and drovers (who seek oxen to sell to graziers in the Midlands) will take nothing but the kind of beast they have come specially to buy. The black cattle of South Wales have, of late years, greatly improved in character. This is partly due to the Herd Book of the breed, and a generally awakened interest in producing the best stock of the kind. It is regretted that in South Wales there are not so many wealthy champions of the native cattle as there are in North Wales. The Welsh nobility in the south have English or Scotch bailiffs; and patronise fashionable breeds from beyond the border rather than the less showy, although not less useful cattle kept by their tenantry. This is not as it should be. It shows a want of sympathy and patriotism. They should be leaders in improving the local breed—especially as it is a breed of acknowledged excellence and one the production of which is one of the sheet anchors of the agriculturists they see around them.—*The Field*.

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## The Farmer's Library.

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### NOTES AND REVIEWS OF NEW BOOKS.

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- 1.—*The Journal of the Royal Agricultural Society.*  
Third Series, Vol. IV.

IN noticing this, we shall, as with former volumes of the *Journal*, confine ourselves to the so-called "original articles," but the present volume contains some of the most original and perhaps the most valuable matter in the section devoted to "notes and communications." The contents of the volume are varied and appeal to all classes interested in the land or in agriculture, whether it be practically or scientifically. But of the original articles few lend themselves to special or short notice.

Among the papers deserving notice as supplying valuable practical information, we would mention the well illustrated articles by three authors on "Field Gates." "Hop Cultivation" is treated by Mr. Charles Whitehead, F.L.S., F.G.S., in a masterly manner. After perusing his paper one cannot but feel that upon many aspects of this subject, there is yet much to be discovered though it will only be discovered by patient research. We believe that the study of hop cultivation, both from a practical and scientific aspect, is receiving the attention of the County Council, and of those who are engaged in conducting technical education under its auspices. This is a step in the right direction, and we hope that the experiments which have been made will result in valuable information being gained. "The Management of Devon Cattle," a subject of much interest to many of our readers, is treated by Mr. Wm. Housman with that knowledge and care which characterise his work.

There is a series of nine articles by well-known men on the question of Winter Feeding, which has more than any other subject engaged the attention of farmers during the winter. These articles, entitled "Suggestions for Stock-feeding in the Winter of 1893-1894," are prefaced by a short notice in which the Editor gives many suggestions sent to him in letters from correspondents competent to give sound advice. As to the contributors to the *Suggestions*, we note the names of

well-known men as Mr. Clare Sewell Read, Mr. H. Simmons, and Mr. R. Stratton.

The article by Mr. T. Bowen Jones, upon "Typical Farms in Cheshire and North Wales," deserves special attention, for, while it only purports to be a report "upon certain selected farms, typical of the varying systems of agriculture within the district in which the Country Meeting of the Society" was held, a practical farmer would, in all probability, be able to gather more really valuable hints from it than from several ordinary papers upon agricultural matters.

"The Management of Berkshire Pigs," by Mr. Edney Hayter, is evidently the work of one who not only knows his subject well, but gives his own experience rather than the result of a study of other people's ideas. The following advice seems to us worthy the consideration of all pig breeders :—

"As the young pigs come on the scene they should each one be taken away and put into a box or hamper kept in readiness, and their little teeth nipped off by pliers made for the purpose. There are eight teeth, two on each side of the upper, and two on each side of the lower jaw: they are as sharp as needles, and if not cut off they punish the sow considerably. This causes her to be uneasy, and in getting up and down she usually kills some of the youngsters. I am sure I save a great many pigs each year by insisting upon having the teeth attended to."

Of the papers which, if not exactly relating to practical agriculture itself, contain points of interest, we may especially mention one by Professor Carruthers on "Anbury, Club-root, or Finger and Toe," a disease which seems to be on the increase among the root crops of England, and which we attribute to a neglect of the practice of liming. Farmers appear to be forgetful of the fact that lime is one of those substances which is not only continually being taken out of the soil by the crops, but also passes away in the drainage waters, probably in larger quantities than any other constituent of value. Mr. Carruthers also contributes a highly interesting and well illustrated article upon "Cross-fertilisation of Cereals."

Among the papers of more limited interest are two from which we will quote one or two sentences that deserve to be widely circulated and well considered.

Mr. William E. Bear, in summarising the results of the Royal Commission on Labour in '82-3, which he considers collected the most complete evidence ever published as to the condition of the agricultural labourer, draws attention to several points of special importance to which perhaps scarcely sufficient attention is at

present given. If the tendency of the farm labourer to migrate to the town is to be stopped, it is important that his conditions of life, especially as regards cottage accommodation, should be made so far as possible equal to those of the town labourer. Thus, it is not satisfactory to read—

“In the best and newest of cottages it is very uncommon to find a boarded floor in the living room, which is almost invariably bricked or tiled, and, even where there is a good layer of cement underneath, such floors are cold, if not damp, and conducive to the rheumatism which is so common among the rural working class.”

Again:—

“The most widely prevalent defect in rural sanitation is an insufficient or impure water supply.”

As the landlord is mainly responsible for these deficiencies, we may hope that having once been pointed out they will soon be remedied. It is not altogether satisfactory to learn that the general conclusion of the assistant commissioners upon the important question of the relations between employers and employed is—

“That the relations are generally friendly, though less cordial than they used to be.”

Professor Axe contributes a good paper upon “Water in relation to Health and Disease,” and points out that even pure water may have detrimental effects when it possesses certain peculiarities. Thus:—

“Horses drinking hard water suffer from derangement of the organs of digestion and from a liability to attacks of colic and other intestinal disorders. The skin of such animals loses its polish and becomes dull and scurfy, the coat stares, and a general state of unthriftiness is induced.”

That farm stock may suffer still far worse ills from drinking impure water, especially if it contains sewage matter, is the main purport of the article. Thus, having quoted Mr. Wynter Blyth's statement that “the bad effects of human sewage on cattle appear to be nil,” the author says:—

“Such a conclusion, however, is certainly not warranted by our experience. That cattle will “grow and fatten on the most sewage-trodden soil,” is a fact in the experience of most practical men; but it is equally true that sewage under certain conditions, not only lowers the standard of health, but becomes distinctly poisonous. Moreover, the

question has been recently brought forcibly before us, as to whether human sewage may not be a means of spreading tuberculosis in our dairy herds.

"We cannot draw general conclusions from individual cases, but when we find, as we have done, nine or ten dairy cows suffering from tubercular disease in the course of a year on a farm irrigated with sewage, the idea of sewage as a possible cause of the malady may be reasonably entertained as a starting-point for further inquiry."

"Acute sewage poisoning sometimes proves rapidly fatal, and we have known cattle to die from its effects in a few hours. Where it assumes a chronic form, the disease runs a slow and protracted course, extending over weeks and months."

We are reminded of the lines which Sir John Evans quoted in his Anniversary Address to the Society of Chemical Industry:—

"Sewage, however disinfected,  
Is not from ill results protected;  
Though made to all appearance pure,  
It still remains not safe, but *sewer*."

How often is it true, as Professor Axe points out, that sometimes, in spite of all efforts, the farmer finds things will not go well. At last some more serious mishap necessitates professional veterinary advice, when—

"The low standard of health, the lean and stunted growth, which perhaps for years have rendered stock-keeping vexatious and unremunerative, are now seen to have had their origin in . . . polluted water."

While we strive to bring home to the farmers of England the best practical lessons, we must not forget that many of the difficulties with which farmers have to contend are not upon the surface nor easily discovered.

The limits of space compel us to leave unnoticed many other articles contained in the volume.

2.—*Agricultural Botany.* By M. C. POTTER, M.A., F.L.S.  
University Extension Series. Methuen & Co.

So long as there are teachers of any science, there will probably be different ways of teaching that science. We hold the view that the main consideration in teaching is to vary the system

according to the capacity of those who are to be taught. Now a book upon Agricultural Botany is evidently intended primarily for agricultural students, and should therefore be written in such a manner as to suit their previous knowledge of the subject. This will be almost nil, hence the necessity of so placing the information that it will at once attract as well as teach. One of the best methods of securing this end is to begin with something that is familiar to the reader, and slowly pass on to that which probably will not have been already learnt. Moreover, so far as possible, the information thus given should depend upon simple experiments which the student can make for himself, and should not be based upon facts which cannot be verified except by those who have special training and appliances. By the former system, the student is at the outset interested in his study, he is taught to observe, and experiment, and is led to draw accurate inferences from his work. But by the second method, he is forced to take for granted the truth of the facts which are put before him; he thus learns by rote, and none of his faculties, save that of memory, are developed.

We have found it an excellent plan to commence the teaching of Agricultural Botany with a seed, such as the Bean seed. With the aid of a pocket knife and a shilling lens, the student may make out the structure of this seed roughly. From this he can pass on to the study of germination, the conditions necessary, and simple means of procuring them. The chemistry of the seed contents before and during germination should next be studied. As soon as the seed is well germinated, it can be removed to solutions containing the necessary substances for its future development, or even to soils of various kinds contained in boxes. All this work, which can be done by any country lad, will be attractive as well as instructive, and will afford material for the more careful and minute study of the structure of the plants, much of which can be made out with a good lens, though some is only possible by the help of a very powerful microscope, which should be used by the teacher for demonstration. In a book the above system may be followed with advantage, and the results which should be obtained by the student, set forth in good illustrations.

The system adopted by the author of this book is the exact opposite to the one we have just advocated. He commences his second chapter with a minute description of the plant cell illustrated with a view of a cell so immensely magnified, that it would be impossible for the ordinary teacher to even show his students a cell with this magnification. This course necessitates at the outset the use of scientific nomenclature, so that the number of long scientific terms in this second chapter, all

of which will be unknown, by disheartening the beginner, would tend to impede his progress.

It is with no desire to find fault with the book that we mention this, but rather to point out what is a common error on the part of those who are now teaching under the County Councils in rural districts. The adoption, in too many cases, of the method we have just condemned, is, in our opinion, one of the main reasons why Technical Education has failed to be properly appreciated by farmers and others interested in Agriculture.

The work is good in many respects, but in others deficient. It is fairly practical, and those who will take the trouble to master the earlier and more technical part will find that it becomes more interesting and practical as it proceeds. The subjects are well illustrated, especially in the chapters devoted to the diseases of plants, and to the grasses. These are followed by a chapter on the leguminosæ, and lastly one on "the classification of plants." In spite of the drawbacks which we have pointed out, we think the book will supply a want and be found useful to students of Agricultural Botany.

### 3.—*Manures and Manuring.* By C. M. AIKMAN.

London: Wm. Blackwood & Sons.

THE subject of the manuring of plants is one of those which has a perennial interest for farmers; hence this book, which brings the subject up to date, is likely to have a good sale. It is, however, more suited for the teacher and student than for the farmer.

After a historical introduction, showing the various phases through which our knowledge and theories regarding manures and their functions have passed, the author considers the fertility of the soil and the physical and chemical conditions upon which it depends. Here the question of the gain and loss of nitrogen by a soil is very fully discussed, and well brought up to date.

The various substances which are used as manure are then considered at length, and on the whole in a very thorough manner. At times we note points upon which we differ from the author. Thus we cannot for one moment accept his classification of substances like lime, salt, and gypsum as "indirect" manures. It is true that in some respects these substances act indirectly, by liberating other constituents of the soil, or by changing its physical condition; but, inasmuch as they also act directly as supplying plant food, we think the term "indirect" manures a misnomer. Speaking of gypsum, the author says,

its use, which was never very abundant in this country, will probably decrease." We doubt this. Some field experiments recently made gave results which point to the very great value of gypsum on certain soils and for certain crops. It supplies both lime and sulphur to the plant, and the latter substance, which is essential to all plants, has been too much overlooked. It is also applicable as supplying lime where ordinary lime would be too strong a manure—for example, upon grass land; and we believe its application upon many pastures would be most beneficial.

A chapter "on the manuring of the common farm crops" will, we trust, be considerably expanded in a future edition of the work. It might be made the most important and most interesting of all the chapters, especially to a practical farmer. At present, although there is much valuable information contained in it, yet this is far too general, and it does not enter sufficiently into details to be of that value to the farmer which a slight revision and enlargement would easily make it.

In spite of these omissions, the work is in our opinion the best scientific exposition of our knowledge of manures and manuring which has yet been written.

#### 4.—*The Bickford System of Irrigation.*

THIS is a reprint of an article which appeared many years ago in the Journal of this Society, to which has been added a preface by Mr. C. T. D. Acland, and illustrations of a new hillside and improved plough for guttering steep or level ground.

The system of irrigation by water meadows is well known, and carried out in many places in the West of England, different methods being used to distribute the water over the land. One of the drawbacks to the water meadow lies in the fact that, as sometimes laid out, the gutters made to carry the water over the land are too large. The Bickford system depends upon small gutters. One of the advantages of small gutters is that in haymaking grass does not escape the haymaker by falling into the gutters, as it does into large ones, subsequently being placed in the hayrick without having been properly dried, and, by becoming musty, deteriorating the value of the rick. But a difficulty has been found in cutting these small gutters so as to carry the water evenly over the land, yet not allow it to sink into the earth without first passing over it. To carry out this system properly, it is necessary that the gutters should have flat bottoms, and to cut these presented some difficulty with the old Bickford plough, especially when they had to be cut upon



a very steep side. Mr. Acland, in conjunction with Mr. Eddy, of the Kennford Ironworks, Exeter, has invented a new plough which simply and effectively overcomes this difficulty, and this plough is described and illustrated in the preface to the reprint.

Farmers who have water meadows, or are thinking of making them, will find in the pamphlet much valuable advice upon the subject.

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5.—*Johnston's Elements of Agricultural Chemistry.* 17th edition.  
Edinburgh and London: Wm. Blackwood & Sons.

THIS is an entirely new edition of the well-known work, which has for so many years taken the first place as a text-book of agricultural chemistry. It has been revised and in great part re-written by C. M. Aikman, and has been brought up to date without sacrificing the original scope and character of the work. So far as we have been able to examine the book, the duty of revising it has been well carried out, and will cause it to remain a standard work on agricultural chemistry. The portion devoted to the chemistry of milk and its products has been largely increased, and is well done. The work is one which every agricultural student should possess.

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6.—*Horses and Stables.* By Lieut.-Gen. Sir J. FITZWYGRAM,  
Bart. London: Longmans, Green & Co.

To those who have to do with horses this book would be invaluable. It is a complete treatise upon the horse. Commencing with the construction and ventilation of stables, and the necessary stable fittings, it passes on to the consideration of the watering and feeding of horses. Then there is an excellent chapter upon forage, illustrated with fifteen full-page plates of the best grasses, of inferior grasses, and of weeds. This is followed by chapters upon grooming, exercising, and stable management. The diseases and injuries from which horses suffer are treated very fully, the remedies and treatment necessary for each being fully explained. In fact, there is no point of importance in connection with the horse, in health or disease, upon which the work does not appear to give all that will be required by the farmer or horsekeeper. What is perhaps the most remarkable fact about the book is, that while it consists of no less than 560 pages, and contains 56 full-page illustrations admirably executed, it can be obtained for the exceedingly small sum of half-a-crown.

7. — *Patents for Inventions. Abridgments of Specifications.*  
*Class 6.—Agricultural Appliances. Period A.D. 1877–83.*  
 London: The Patent Office.

THE patent laws of this country make no provision for an official search as regards novelty; consequently, British patents are taken out at the risk of applicants, who are expected to cause a search to be made as to the novelty of their inventions, either before they make their applications or before they complete the same.

To meet this want, abridgments have been completed referring to all specifications for the period A.D. 1877–83, and these, together with the abridgments in the Illustrated Official Journal from A.D. 1884 onwards (to which the annual indexes refer), will comprise a means for searching as to novelty as regards all living patents, and should enable the intending patentee to satisfy himself that he would not infringe existing patent rights. To complete a search, however, as to absolute novelty, a further exhaustive examination of technical literature would be necessary.

The abridgments will, as issued, be sent to the Science and Art Department, South Kensington, the Guildhall Free Library, and other like institutions, where they may be consulted.

The above volume is one of a large number of Abridgment Classes, which treat of every patent classified under certain heads. The class "Agricultural appliances for the treatment of land and crops," includes all implements used in the preparation of land, and the cultivation, sowing, and harvesting of crops. The period A.D. 1877–83 comprises the most important era of the development of the sheaf-binding harvesting machine. During the early portion of the period many of the inventions relate to such machines, where wire is used as the binding material; but after 1881 there are no further inventions of this kind. During the whole period there are about ninety-two sheaf-binders, and of this number twenty-four relate to wire-binding machines, and most of the others to string binders; there being one invention for a machine binding with straw, and one for a machine using metal bands. Of the inventions relating to reaping-machines many are of the side delivery class, and in these a good deal of attention has been devoted to controlling the action of the platform rakes, so as to regulate at will the size of sheaf.

We have received from the Patent Office a list of the Abridgment Classes which they purpose to issue. Amongst these, we note one on "Agricultural appliances, farmyard and the like (including the housing, feeding, and treatment of animals)." Another on milking, churning, and cheesemaking. To all those

who are interested in agricultural patents, these abridgments will prove of very great value, and will be most interesting even to those who are merely concerned in the use of the machines, or to guide them in purchasing new ones.

8.—*Farm Live Stock of Great Britain.* By R. WALLACE.  
3rd edition. London: Crosby, Lockwood & Son.

THE first point which strikes one upon a perusal of this work is that in many respects it shows a considerable improvement upon former editions, more especially in the arrangement of the matter, and in the treatment of the subjects. One of the most unique, as also one of the most valuable, features of the work is a series of four "distribution" maps. The first of these shows the height of the land above sea-level by a series of colours representing respectively 0–500 feet above sea-level, 500–1500, 1500–2500, and above 2500. Upon this map there are twenty-one numbers printed in red ink, indicating the distribution of the twenty-one breeds of cattle which inhabit our isles. The second map shows the distribution of cattle according to the number which are found upon a square mile of surface, by a series of six tints, representing respectively from under 30 to over 150 head per square mile. The third map shows the distribution of sheep in a similar manner, and the fourth the distribution of agricultural population.

In addition to these maps the work is literally crowded with photographs of the typical breeds of cattle, many of which are excellent, and on the whole all good, with a few exceptions, one or two having been taken in bad positions, and one or two being indistinct.

The faults which we have found in the work, after having kept it before us and referred to it as occasion required, are few; one is that some of the subjects although mentioned are difficult to find in spite of a copious index, while the principal fault is that in many parts the work is sketchy, and does not treat subjects with sufficient depth to be of use to the practical farmer. It may be said that this is inevitable in a work of limited dimension covering so large a field, and the excuse would be a reasonable one. On the other hand, so much is written nowadays in the agricultural papers upon these subjects in a sketchy manner that in a work emanating from the Professor of a University, we may reasonably ask that this style may be laid aside, and the subjects treated in a more thorough and scholastic manner. This perhaps was not the intention of the author, which is described by him in the preface in the following

words: "It is hoped that the new edition—so much enlarged and improved as compared with the two previous ones—will be found useful by school-masters and others engaged in teaching agriculture under the County Councils, and that the illustrations produced from photographs of picked specimens of live animals, chosen as typical representatives of the different breeds to which they belong, will be of special value as a means of instruction, as well as for awakening the interest of the youthful agriculturists of the country in the herds and flocks by which they are surrounded and for developing their powers of observation."

We believe that in this aim the author has succeeded, and that the book, and especially the appendices, will be found most valuable to the student of agriculture.

9.—*Butter-making*. A Prize Essay by a Farmer's Daughter, Miss VELLACOTT. Williton: Cox Bros.

THIS little essay not only does credit to the writer, but also to the teaching which is given at the School of the Bath and West and Southern Counties Society. It contains a brief description of the composition of milk, and of the various means of separating cream, including the Devonshire method. The ripening of cream, and its conversion into butter, are then described, and the essay will be found a very good and simple exposition of the practice of butter-making suitable for distribution among dairy-maids who themselves have not an opportunity of attending classes.

10.—*Horticulture*. By J. WRIGHT. London: Macmillan & Co.

THIS is one of the "Primers" issued by this well-known firm of publishers, several previous volumes of which have been noticed in this Journal. It in every way maintains the repute which all these small works have gained. The contents are notes, enlarged and illustrated, of ten lectures originally delivered by the author for the Surrey County Council, and at the end of each chapter or lecture is a series of questions and answers. The subject-matter is treated in a concise and thoroughly practical manner, and we can confidently recommend the work as illustrating how the subject of Horticulture can be treated, so as to be both interesting and educational at the same time. As a fair illustration of the method of the author and as a type of the work, it is only necessary to quote one paragraph. We will select that on "cuttings."

"It has been said that plants raised from seed are new or distinct individualities; those raised from cuttings are not, but

merely an extension of the parents, possessing precisely the same habits and having exactly the same cultural needs."

"When cuttings are taken from greenhouse and window plants in full growth in summer, as most of them should be, before flower-buds form, then inserted in damp sandy soil, and exposed to the sun and air, they do not take up moisture through the cut ends so fast as it escapes from the leaves, therefore these droop, wither, fall, and the cuttings die.

"But if quickly made and inserted in similar soil, and a tumbler or bell-glass is pressed down over them and shaded from the sun, the escape of moisture from the leaves is prevented; these then remain fresh and roots form.

"The production of roots is formed by the sinking of the sap, this collecting at the base and forming a lip or cushion, known as a callus, from which roots protrude. When this occurs and growth starts the young plants must have sun and air.

"Cuttings of fruit-trees and bushes are best inserted in the autumn as soon as the leaves can be shaken off, because the sap is descending then, and the earth is still warm, therefore rooting commences quickly. If the work is deferred till the sap commences rising in spring, most of the cuttings may die. Young, firm wood made in the summer, in some cases with a heel of the old wood, is the right kind to choose.

"The ends of all cuttings should be made quite smooth close under a joint with a sharp knife, as a clean wound heals quickly, a jagged wound slowly."

How cuttings of bush fruits are made and inserted is then shown by woodcuts.

One shows "all the buds cut clean out of the cutting, except four at the top for forming the branches, then, with proper pruning, we eventually have a clean-stemmed fruitful bush." Another shows "the cutting inserted with all the buds on the stem from which sucker growths may issue. The result of this is a confusion of growths, which cannot be converted into a satisfactory fruitful bush by any amount of after-pruning." Then follows a woodcut showing points of shortening for decreasing the number of branches; "but the suckers spoil the fruit or tree, and might have been easily prevented."

In such manner the author treats of the soil; raising crops, plants and trees; manuring of vegetables and fruits, and how to gather, store, and market them; and of several other subjects intimately connected with Horticulture.

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- 11.—*Agricultural Analysis*. By F. T. ADDYMAN; and *Practical Agricultural Chemistry*. By J. B. COLEMAN and F. T. ADDYMAN. London: Longmans, Green & Co.

THE former of these works is intended for the advanced student of agricultural chemistry, and the latter for the junior student. They are well printed and illustrated, and in our opinion well adapted to the purpose for which they were intended. The former work, indeed, is likely to have a larger sale than could have been anticipated when it was written; for the recent passing of the Fertilisers Act has given an impetus to the study of agricultural analysis, which is as extended as it was unforeseen, and we know no English work which gives a better account of the methods of agricultural analysis than this.

The latter work is adapted as a first introduction to chemistry for pupils in schools, where an agricultural side is being developed.

- 12.—*History of the Devon Breed of Cattle*. By JAMES SINCLAIR. London: Vinton & Co.

To all who take an interest in Devon cattle we can confidently recommend this capital history of the breed. After considering "the origin of the breed," "early historical breeders," and "famous old herds," the author passes on to review "existing herds in England," and "herds in foreign countries and in the colonies." Then follow chapters on the characteristics of the breed and upon systems of management. Although Devons are best known and have most repute as good fattening animals, it is very evident that they possess a potentiality as milkers which it only needs time and trouble to develop and to make them second to no other breed in the country as milk producers; especially where milk of good quality—rich in fat—is desired, as for butter and cheese-making. Analyses of the milk of some of the Devons is given, and the figures are certainly remarkable. Thus, the percentage of fat varies from 4.36 to 5.40, and the total solids from 14.74 to 15.52. These figures compare well with those of the milk yielded by an average Jersey or Guernsey cow. The question naturally arises, how far do they represent the normal quality of the milk of the Devon cow. It is rather difficult to find statistics as to the quality of Devon milk. Devons are, unfortunately, seldom presented for competition in milking trials, such as are held by the British Dairy Farmers' Association in London, and if they compete for such prizes at county shows, the results do not appear to be made sufficiently widely known.

We trust that this book will draw attention to the possibilities which may reside in the Devon as a milker.

The work shows evidence of great care and research on the part of the author, and should be possessed by all those who are interested in the breed.

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- 13.—*Report on the Improvement of Indian Agriculture.* By J. A. VOELCKER, Ph.D., &c. London: Eyre & Spottiswoode.

THIS is an excellent Report by the Consulting Chemist to the Society on a great work. If we consider the enormous extent of India, its varied climate, geology, and customs, we realise better the difficulty of the task for anyone who has not lived in India and spent most of his life among the people, to grasp the many aspects and difficulties of the situation from a visit of comparatively short duration. Dr. Voelcker appears to have done so rapidly and thoroughly, and the opinion of those who know India well and have had to do with its Government, seems to be that he has accomplished his task in a manner that deserves unstinted praise. If the future Governors of India carry out the many suggestions contained in the Report, they will go far to increase the prosperity of the country, and also prevent, so far as man can prevent, if not the recurrence, at least the severity of those famines which at times devastate portions of the Empire.

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# **Bath and West and Southern Counties Society.**

## **GLOUCESTER MEETING, 1893.**

### **JUDGES.**

#### **HORSES.**

**Agricultural.**—T. B. FRESHNEY, South Somercotes, Louth, Lincolnshire;  
W. R. ROWLAND, Creslow, Aylesbury.

**Hunters, Hacks, Ponies, and Harness.**—M. ANGAS, Cattleholmes,  
Hull; T. ROBSON, Wold House, Driffeld, East Yorkshire.

#### **CATTLE.**

**Devon.**—S. BAILEY, Hornshay, Nynhead, Somerset; J. FORRESTER,  
Bryanston, Blandford.

**Shorthorn.**—R. L. ANGAS, Blenheim, Woodstock; M. SAVIDGE, Sarsden  
Lodge Farm, Chipping Norton.

**Hereford.**—J. P. TERRY, Berry Field, Aylesbury; J. WHITE, Manor  
Farm, Zeals, Wilts.

**Sussex.**—A. AGATE, Grandford House, Horsham; A. HEASMAN, Court  
Wick, Littlehampton.

**Jersey.**—W. ASHCROFT, Layhams Farm, Hayes, Kent; A. W. BYRON,  
Duckmanton Lodge, Chesterfield, Derbyshire.

**Guernsey.**—A. DUNLOP, Church Farm, Hendon, N.W.; J. R. NEWBERRY,  
Strand, Teignmouth.

**Kerry and Dexter Kerry.**—G. T. BARHAM, College Farm, Finchley,  
Middlesex; F. A. HORDEHN, Roodlands, Edenbridge, Kent.

**Dairy.**—R. L. ANGAS, Blenheim, Woodstock; M. SAVIDGE, Sarsden Lodge  
Farm, Chipping Norton.

#### **BUTTER TEST.**

E. MATHEWS, The Grove, Potter's Bar, Herts.

#### **SHEEP.**

**Leicester, Cotswold, Devon, and other Long-Woolled.**—R. JACOBS,  
Signett Hill, Burford, Oxon; W. P. VOSPER, Merafield, Plympton.

**Southdown, Hampshire Down, and other Short-Woolled.**—  
J. FLOWER, Chilmark, Salisbury, Wilts; H. PENFOLD, Selsey, Chichester.

**Shropshire, Oxford Down, Horned, and Mountain.**—R. THOMAS,  
Baschurch, Salop; J. TREADWELL, Upper Winchendon, Aylesbury.



## INSPECTORS OF SHEARING.

J. FRANKLIN, Scotsgrove, Thame, Oxon; H. MAYO, 4, Temple Terrace, Dorchester.

## PIGS.

H. HUMFREY, Shippon, Abingdon; G. M. SEXTON, Stone Lodge, Ipswich.

## CHEESE, BUTTER, AND CREAM.

J. HUDSON, Sen., 50 & 52, Ludgate Hill, London; J. WERR, Brookville, Kensington, London, W.

## BUTTER WORKERS.

Prof. CARROLL, Royal Albert Farm, Glasnevin, Dublin; T. RIGBY, Sutton Weaver, via Warrington.

## POULTRY.

J. DIXON, North Park, Lidget Green, Bradford; W. B. TEGETMEIER, *Field Office*, Breams Buildings, London, E.C.

## HORSE SHOEING.

T. AUBREY, 19, The Paragon, Bath; J. D. BARFORD, 57, Above Bar, Southampton.

## AWARDS OF PRIZES FOR STOCK, 1893.

\* \* An animal designated in this list as the "reserve number" is entitled, *conditionally*, to succeed to any prize that may become vacant in its class by reason of the animal placed above it by the Judges failing afterwards to qualify.

† Animals, where not otherwise stated, may be considered to have been bred by the Exhibitor.

ABBREVIATIONS EXPLAINED:—S., sire; d., dam; s. of d., sire of dam; y., year; m., month; w., week; d., day; R., Reserve; V.H.C., Very Highly Commended; H.C., Highly Commended; C., Commended.

All ages calculated to May 31, 1893.

### HORSES.

#### FOR AGRICULTURAL PURPOSES.

##### CLASS 1.—*Shire Stallion, foaled before 1891.* [8 entries.]

**I. (£20) and special local (£20).\***—MAJOR HON. L. BYNG, Sherborne, North-leach, Gloucestershire, brown, **Cœur de Lion IV.** (11233), 5 y., bred by B. Chambers, Moreton-in-Marsh; s., Hitchin Conqueror (4458), d., Bonny, s. of d., A I (1).

**II. (£10).**—W. GILBEY, Elsenham Hall, Essex, bay, **Mars Victor** (9889), 5 y., bred by A. B. Freeman-Mitford, C.B., M.P., Batsford Park, Moreton-in-Marsh; s., Hitchin Conqueror (4458), d., Rockington Beauty (Vol. v.), s. of d., Champion (457).

**III. (£5).**—P. A. MUNTZ, M.P., Dunsmore, Rugby, bay, **Dunsmore Albion** (11321), 4 y., bred by A. Aitkin, Spalding; s., Salisbury (5324), d., Metallic (8489, Vol. xi.), s. of d., Electric (3069).

**R.**—LORD TREDEGAR, Tredegar Park, Newport, Mon., black, **Black William** (12785), 3 y., bred by Lord Wantage, Lockinge Park, Wantage, Berks; s., Prince William (3956), d., Candy (3082, Vol. vii.), s. of d., Candidate (2405).

##### CLASS 2.—*Shire Stallion, foaled in 1891.* [6 entries.]

**I. (£15).**—P. A. MUNTZ, M.P., Dunsmore, Rugby, bay, **Dunsmore Charlemagne**, 2 y., bred by T. Freshney, South Summercoates, Louth; s., Locksley II. (13282), d., Saltfleet Forget-me-not (Vol. xiii.), s. of d., Hydraulic (1130).

**II. (£10).**—A. HENDERSON, Buscot Park, Faringdon, bay, **Buscot Prince**, 1 y., 51 w., 5 d.; s., Salisbury, d., Asinath, s. of d., Duke of Cambridge II.

**III. (£5).**—G. LEWIS, Ercall Park, Wellington, Salop, bay, **Carbonic**, 2 y., bred by J. Humphreys, Evenall, Oswestry; s., Carbon (3523), d., Evenall Frivolty, s. of d., Pride of Leighton (1771).

**R. & R. for special local.\***—T. JAMES, Vineyards Farm, Charlton Kings, brown, **Bangrove Ben** (13841), 1 y., 11 m., 3 w.; s., Laughing Stock (4516), d., Bangrove Lassy, s. of d., Nutland Champion (2490).

\* Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Classes 1 or 2.

**CLASS 3.—Shire Mare and Foal, or in-Foal. [9 entries.]**

**I. (£20)** and medal (value £10).\*—P. A. MUNTZ, M.P., Dunsmore, Rugby, roan, in foal, **Dunsmore Fashion** (6281), 6 y., bred by R. Capes, Grange-over-Sands; s., Vulcan (4145), d., Kit (664, Vol. iv.), s. of d., Champion (440).

**II. (£10).**—J. BLYTH, Wood House, Stansted, Essex, bay, **Blythwood Bountiful** (Vol. xiii.), 4 y., bred by J. Blunt, Breendon-on-the-Hill, Ashby de la Zouch; s., Harold (3703), d., Bonny Lady (Vol. ix.), s. of d., Royal Albert (1883); with foal by Hitchin Conqueror (4458).

**III. (£5)** and special local (£10).†—G. L. FOSTER HARTER, Puckrup Hall, Tewkesbury, brown, **Judy III.** (5050), 7 y., bred by Duke of Marlborough, Blenheim Palace, Woodstock; s., Electric (3069), d., Judy (Marlborough's), s. of d., Napoleon (1604); with foal by Hydrometer (3744).

**H. C.**—W. H. GODDING, Brimslade, Marlborough, chestnut, in foal, **Savernake Blossom**, 4 y., 3 m., 1 w.; s., Bar None (2388), d., Carlton Blossom (Vol. x.), s. of d., Marshland Active (1484).

**CLASS 4.—Shire Filly, foaled in 1890. [5 entries.]**

**I. (£10)** and **R.** for medal.\*—P. A. MUNTZ, M.P., Dunsmore, Rugby, bay, **Dunsmore Gloaming** (14655), 3 y., bred by H. R. H. the Prince of Wales, K.G., Sandringham, Norfolk; s., Harold (3703), d., Glime (4113, Vol. viii.), s. of d., Staunton Hero (2918).

**II. (£5).**—LOEB ROTHSCHILD, Tring Park, Herts, bay, **Ballam Fan**, about 3 y., bred by — Kirkham, Ballam, Lytham; s., Mahomed, d., Polly, s. of d., Northern King.

**R.**—SIR H. F. DE TRAFFORD, Bart., The Flordon Stud Farm, Norfolk, bay, **Thrift II.**, 3 y. off, bred by C. V. Young, Brancaster, King's Lynn; s., Julian (3766), d., Queen (Vol. xiii.), s. of d., Luck (1424).

**C. & R.** for special local.‡—S. FORSTER, Postlip Hall, Winchcombe, Gloucestershire, bay, **Bridesmaid**, 3 y., bred by J. Parnell, Rugby; s., Bank of England (4841), d., Welcome Bride, s. of d., Royal George.

**CLASS 5.—Shire Filly, foaled in 1891. [9 entries.]**

**I. (£10).**—P. A. MUNTZ, M.P., Dunsmore, Rugby, bay, **Alvaston Rose** (Vol. xiv.), 2 y., bred by R. B. Bonsall, Alstonfields, Ashbourne; s., Regent II. (6316), d., Flower, s. of d., Honest Tom (11646).

**II. (£5).**—H. MILLARD, Home Leaze Farm, Shivelham, Berks, bay, **May Darling**, 1 y., 11 m., 3 w.; s., Prince William (3956), d., Blossom (Vol. xi., p. 550), s. of d., Cricklade Sampson (7065).

**III. (£3)** and special local (£10).‡—S. FORSTER, Postlip Hall, Winchcombe, bay, **Cronton Hopeful**, 2 y., bred by G. Lewis, Ercall Park, Wellington; s., King John IV. (11711), d., Ercall Hope, s. of d., Pride of Leighton II. (1771).

\* Given by the Shire Horse Society, for the Best Mare or Filly in Classes 3, 4 or 5. (Subject to special conditions.)

† Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Class 3.

‡ Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Classes 4 or 5.

*Prizes awarded to Horses for Agricultural Purposes.* v

**R.**—S. FORSTER, black, **Forest Chance**, 2 y., bred by F W. Hardy, Barton-under-Needwood; s. King Charming (3166), d. Diamond, s. of d., William the Conqueror (2710).

**ANY OTHER AGRICULTURAL BREED.**

**CLASS 6.—Agricultural Stallion, foaled before 1891. [6 entries.]**

**I. (£20.)**—LORDS A. and L. CECIL, Orchardmains, Tunbridge, Kent, bay Clydesdale, **Prince Eddie** (9637), 3 y., 2 m., 11 d., bred by Sir J. A. Hay, Bart., Kings Meadows, Peebles, N.B.; s., Prince of Albion (6178), d., Lady Gallant (10658), s. of d., Top Gallant (1850).

**II. (£10.)**—MISS E. C. TALBOT, Margam Park, Port Talbot, bay Clydesdale, **Tullyallon** (9455), 3 y., 11 m., bred by W. Kay, Kincardine-on-Forth; s., The Vicar (5204), d., Nancy of Inch (9809), s. of d., Corsewall (1420).

Special local (£20).\*—LORD FITZHARDINGE, Berkeley Castle, Berkeley, bay Clydesdale, **Prince of Berkeley** (8149), 5 y., 3 w., 3 d., bred by the late Sir R. Loder, Whittlebury; s., Stouchenge (4039), d., Nancy of Whittlebury (5539), s. of d., Prince of the Forest (2354).

**R.** for special local.\*—J. E. BIRT, Heath Farm, Dymock, bay Clydesdale, **Duke**, 3 y., 11 m., 2 w., bred by E. and A. Stanford, Eatons, Ashurst, Sussex; s., Monarch.

**CLASS 7.—Agricultural Stallion, foaled in 1891. [1 entry.]**

**I. (£15.)**—LORDS A. and L. CECIL, Orchardmains, Tunbridge, Kent, bay Clydesdale, **Curfew**, 2 y., 8 d.; s., Claymore (3522), d., Campanella (4480), s. of d., Druid (1120).

**CLASS 8.—Agricultural Mare and Foal, or in-Foal. [7 entries.]**

**I. (£20.)**—MISS E. C. TALBOT, Margam Park, Port Talbot, bay Clydesdale, in foal, **Carillon**, 4 y., 1 m., 1 w., 1 d., bred by Lords A. and L. Cecil, Orchardmains, Tunbridge; s., Claymore (3522), d., Campanella (4480), s. of d., Druid (1120).

**II. (£10) and special local (£10).†**—LORD FITZHARDINGE, Berkeley Castle, Berkeley, bay Clydesdale, **Rosanna**, 7 y., 1 m., bred by G. Aitken, Bank Head, Aberdeen, Fife, N.B.; s., Prince Endrick (2349), d., Daisy, s. of d., Prince Edward of Wales (1255); with foal by Pure Bone (1510).

**III. (£5.)**—MISS E. C. TALBOT, bay Clydesdale, **Lily of Meadowfield**, 3 y., 10 m., 3 w., 4 d., bred by W. Renwick, Meadowfield, Corstorphine; s., Laird of Ladyton (5131), d., Lily of Meadowfield (6658), s. of d., Old Times (579); with foal by Prince Alexander (8899).

**R. & R.** for special local.†—LORD FITZHARDINGE, bay Clydesdale, **Lily of Berkeley**, 5 y., 3 w., 5 d., bred by the late Sir R. Loder, Whittlebury; s., Stonehenge (4037), d., Lily of Whittlebury (6371), s. of d., Drumflower Farmer (286); with foal by Prince of Berkeley (8149).

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\* Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Classes 6 or 7.

† Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Class 8.

**CLASS 9.—Agricultural Filly, foaled in 1890. [2 entries.]**

**I. (£10).**—LORDS A. and L. CECIL, Orchardmains, Tunbridge, brown Clydesdale, **Pride of Auchintoshan**, 3 y., bred by A. McLacklin, Culit, Stirlingshire; s., Lord Ailsa (5974), d., Jess of Culit (8792), s. of d., Crown Prince (206).

**R.**—LORDS A. and L. CECIL, bay Clydesdale, **Queen Bess**, 3 y., bred by T. M. Gordon, Cocklick, Dalbeattie; s., Lothian King (6985), d., Brita (8444), s. of d., Macgregor (1487).

**CLASS 10.—Agricultural Filly, foaled in 1891. [2 entries.]**

**I. (£10)** and special local (£10).<sup>\*</sup>—T. CORSON, Harling Manor Farm, Andoversford, R.S.O., bay Clydesdale, **Maid of the Nith**, 2 y., 1 m., 1 w.; s., King Darnley, d., Lady Lawrence, s. of d., Prince Lawrence.

**R.**—M. J. SUTTON, Kidmore Grange, Caversham, Oxon, chestnut Suffolk, **Kidmore Matchett**, 2 y.; s., Saunterer (1716), d., Matchett (2295), s. of d., Tapster (1532).

**HUNTERS.****CLASS 11.†—Thoroughbred Stallion travelling in the County of Gloucester. [2 entries.]**

**I. (£25).**—J. HOMES, Hill House, Hartpury, Gloucester, black, **Ambergris**, 6 y.; s., Rugby; d., Teh.; s. of d., Sterling.

**CLASS 12.—Hunter Mare or Gelding, foaled in 1889. [16 entries.]**

**I. (£20).**—W. ARKWRIGHT, Everleigh Manor, Marlborough, chestnut gelding, **Knight Errant**, 4 y., 3 w., 2 d.; s., Knight Templar; d., Hawthorne; s. of d., Highthorn.

**II. (£10).**—W. R. H. TYLER, Rodhuish, Withycombe, Taunton, brown gelding, **Paragon**, 3 y., 10 m., 3 w.; s., Old Buck; d., Ida; s. of d., Marsh Heron.

**III. (£5).**—J. S. WILKES, Tredington, Slipston-on-Stour, brown gelding, 4 y.

**R.**—J. V. KEEVIL, Shaw Farm, Melksham, chestnut gelding, **Bon-bon**, 4 y., 2 m.; s., Westerhall; d., Chocolate (H.I.S., Vol. iv., No. 505).

**R.** for special local.‡—T. H. PEARCE, Lower Court Farm, Long Ashton, Bristol, chestnut filly, **Countess**, 4 y.; s., Truant.

**CLASS 13.—Hunter Filly or Gelding, foaled in 1890. [13 entries.]**

**I. (£15).**—G. ALEXANDER, Warley Lodge, Brentwood, bay gelding, **Whitewings**, 3 y., 4 w. 1 d.; bred by J. E. Bartei, Williamstrip Farm, Fairford, Gloucestershire; s., Peppermint; d., Confidence; s. of d., Huguenot.

<sup>\*</sup> Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Classes 9 or 10.

† Given by the Gloucester Local Committee.

‡ Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Classes 12 or 13.

**II. (£5).**—F. J. COLERIDGE-BOLES, Barnset, Stratford-on-Avon, bay filly, **Lady Gladys**, 3 y., 1 m., 2 w., 6 d.; s., Plutarch; d., Huntress (355).

**III. (£3) and special local (£10).\***—W. H. FLETCHER, Shipton, Andoversford, Gloucestershire, bay gelding, **Master Ring**, 3 y., 1 m., 5 d.; bred by S. Forster, Postlip Hall, Winchcombe; s., Ringleader; d. Abigail; s. of d., St. Peter.

**R.**—J. HOLMES, Hill House, Hartpury, Gloucestershire, chestnut filly, **Lady Hamilton**, 3 y.; bred by J. Warsdall, Beaunber, Horncastle; s., Amalfi; d., Darling.

**CLASS 14.—Hunter Filly or Gelding, foaled in 1891. [13 entries.]**

**I. (£15) and special local (£10).†**—W. G. CANNING, Hartpury, Gloucester, chestnut gelding, 2 y.; s. Canadian.

**II. (£5).**—T. and S. BRADBURN, Astwood Hill, Redditch, bay gelding, **Land Mark**, 2 y.; bred by W. E. Oakeley, Cliff House, Atherstone; s., Preferment; d., Watchspring.

**III. (£3).**—F. J. COLERIDGE-BOLES, Baraset, Stratford-on-Avon, brown filly, **Zest**, 2 y., 2 m., 1 w., 1 d.; s., Zeal; d., Huntress (355).

**R. & H. C.**—C. MILES, Tatenhill, Burton-on-Trent, bay brown gelding, **Pince Pero**, 2 y., 1 m., 3 w., 4 d.; s., Pero Gomez; d., Lavinia (74).

**CLASS 15.—Hunter Filly or Colt, foaled in 1892. [10 entries.]**

**I. (£15) & R. for special local.†**—J. HOMES, The Hill House, Hartpury, Gloucester, chestnut colt, **Prince Idwal**, 1 y.; bred by J. Gill, High Street, Welshpool; s., Eglamore; d., Gwen (Vol. v.); s. of d., Welsh Flyer.

**II. (£5).**—C. MILES, Tatenhill, Burton-on-Trent, bay colt, **Count Bercy**, 1 y., 1 m., 3 w., 4 d.; s., Bercy; d., Countess (313); s. of d., Pero Gomez.

**III. (£3).**—F. B. WILKINSON, Blyth Spital, Rotherham, brown filly, **Lady Cecil**, 1 y.; bred by — Morrell, Maltby, Rotherham; s., Salisbury.

**R.**—W. M. BAKER, Hasfield Court, Gloucester, bay colt, **Ledus**, 1 y., 1 m., 3 d.; s., Velleda; d., Grace Darling.

**CLASS 16.—Hunter Mare and Foal, or in-Foal. [7 entries.]**

**I. (£25) and Medal.†**—C. E. BRUCE-FRY, Mollington, Banbury, brown, **Princess** (vol. iv.), 9 y.; s., Baron Birdcatcher; d., by Gin; with foal by Lifeboat.

**II. (£10).**—F. B. WILKINSON, Blyth Spital, Rotherham, brown, and foal, **Petticoat**, 6 y.; bred by C. Clark, Ashby de la Launde, Lincoln; s., Outfit; l., by Young Voltigeur.

**III. (£5).**—R. J. MANN, Home Farm, Acton Burnell, brown, and foal, **Ammonia**, 21 y.; bred by the Yardley Stud; s., Optimist; d., Amaranth; s. of d., Newminster.

\* Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Classes 12 or 13.

† Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Classes 14 or 15.

‡ Given by the Hunters' Improvement Society for the best Brood Mare in-foal to, or having bred a foal to, a thoroughbred horse, provided such mare was a Prize-winner, or was Reserved, in Class 16, and had not previously won the Hunters' Improvement Society's Medal or Premium as a Brood Mare.

viii *Prizes awarded to Hacks, Ponies, and Harness Horses.*

**R.** and special local (£10).\*—W. A. VILLAR, New Court, Charlton Kings, Cheltenham, grey, **Kate**, 9 y.; s., Victor; d., Trick; with foal by Royal Fern.

**HACKS.**

**CLASS 17.—Hack Mare or Gelding, over 14 hands. [8 entries.]**

**I. (£10).**—W. POPE, Cannon House, Downham Market, Norfolk, bay mare, **Lady Isabella** (2194 H.S.B.), 6 y.; bred by J. Rolfe, Carlton, Forhoe, Wymondham; s., Confidence (158); d., Jenny Wren (269).

**II. (£5).**—G. GREENALL, Walton Hall, Warrington, bay mare, **Lady Alice II.**, 5 y.; s., Lord Derby II.; d., Lady Alice; s. of d., Star of the West (Cooks).

**III. (£3).**—J. H. CLIFTON, Keynsham, Bristol, bay mare, **Duchess of York**.

**R. & H. C.**—S. B. Carnley, Norbury House, Alford, Lincolnshire, bay gelding, **Matchless**, 7 y., 11 m., 2½ w.; s., Lord Derby II. (417, H.S.B.).

**C.**—T. COOK, Riding School, Bell Lane, Gloucester, bay mare, **Countess**: —J. TROWER, Parklands, Whitminster, near Stonehouse, bay mare, **Joan**, 5 y., bred by Sir G. Codrington, Bart., Dodington Park; s., Zeal.

**CLASS 18.—Hack Mare or Gelding, not over 14 hands. [7 entries.]**

**I. (£10).**—Sir H. F. DE TRAFFORD, Bart., The Flordon Stud Farm, Norfolk, bay mare, **Dorothy Derby** (1081), 6 y. off, bred by W. J. Taffe, Heath Bank House, Cheadle, Cheshire; s., Lord Derby II. (417); d., Burton Agnes (608); s. of d., Danegelt (174).

**II. (£5).**—A. E. EVANS, Bronwylla, Wrexham, skewbald gelding, **Gay Jack**, 7 y., bred by — Mann, Fakenham, Norfolk; s., Model; d., Hempton Lass.

**III. (£3).**—G. GREENALL, Walton Hall, Warrington, dark brown mare, **Lady Rosebery**, aged; s., Grigg's Model II.; d., Gipsy; s. of d., Young Robin Hood.

**R. & H. C.**—W. POPE, Cannon House, Downham Market, Norfolk, bay mare, **Elegant** (H.S.B. 875), 7 y., bred by S. Leeds, Barsham, Norfolk; s., Model (1054).

**PONIES.**

**CLASS 19.—Pony Mare or Gelding, not over 13 hands. [6 entries.]**

**I. (£7).**—A. H. MILTON, Castleton House, Clifton, chestnut, **Duchess**, 3 y.

**II. (£3).**—H. BUTLER, Abbey Park, Keynsham, bay gelding, **Rajah**, 4 y., bred by J. H. Clifton, Keynsham; s., Rajpoot.

**III. (£2).**—H. J. H. BABER, Elboro', Locking, Weston-super-Mare, grey, **My Queen**, 6 y., 1 m., 1 w., 1 d.; s., Star of the West; d., Little Bella.

**R. & H. C.**—Sir W. F. GUISE, Bart., Elmore Court, Gloucester, brown Shetland gelding, **Tommy**, 8 y.

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\* Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester, for the best entry in Class 16.

**HARNESSES.**

**CLASS 20.—Harness Mare or Gelding, over 14 hands and not over 15·2.**  
[11 entries.]

**I. (£10.)**—W. POPE, Cannon House, Downham Market, Norfolk, bay mare, **Nelly** (H.S.B. 2349), 8 y., bred by J. Bealby, Wisbech; s., Confidence 158; d., Kitty; s. of d., Shales (746).

**II. (£5.)**—Sir H. F. DE TRAFFORD, Bart., The Flordon Stud Farm, Norfolk, black mare, **Moonlight**, 5 y., bred by F. Crisp, Hall Farm, Eccles; s., Old Times (1863); d., Sheppard F. Knapp (762).

**III. (£3.)**—S. B. CARNLEY, Norbury House, Alford, Lincolnshire, brown mare, **Mermaid**, 5 y., 11 m., 3½ w., bred by the late R. Cooke, Bury St. Edmunds; s., Don Carlos (183, H.S.B.); d., Empress; s. of d., Eclairer.

**R. & H. C.**—A. E. EVANS, Bronwylfa, near Wrexham, brown gelding, **Lord Bath**, 5 y.; s. Champion Shales; d., Pauline.

**CLASS 21.—Harness Mare or Gelding, not over 14 hands.**  
[6 entries.]

**I. (£10.)**—J. H. CLIFTON, Keynsham, bay gelding, **The Don**.

**II. (£5.)**—Sir H. F. DE TRAFFORD, Bart., The Flordon Stud Farm, Norfolk, bay mare, **Dorothy Derby II.** (vol. ix.), 3 y. off, bred by C. W. Wilson, Rigmaden Park, Kirkby Lonsdale; s., Little Wonder II. (1610); l., Dorothy Derby (1081); s. of d., Lord Derby II. (417).

**III. (£3.)**—A. H. MILTON, Castleton House, Clifton, roan mare, **Lady Elsie**, 6 y.

**R.**—W. WARNER, Astwoods, Staverton, near Cheltenham, brown, **Tommy**, 5 y.

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**CATTLE.**

**DEVON.**

**CLASS 22.—Devon Bull, calved in 1889 or 1890.** [5 entries.]

**I. (£15.)**—H. B. BLACKBURN, Townleigh, Lew Down, Devon, **Star** (2888), 3 y., 4 m., 2 d., bred by J. Tremayne, Sydenham, Lew Down; s., Duke of Flitton 17th (1544); d., Day Star (8779); s. of d., Bravo (1686).

**II. (£10.)**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, Somerset, **Masterpiece** (2837), 2 y., 11 m., 4 w., 1 d., s. General Gordon (1974); d. Moss Rose 8th (7017), s. of d., Lord Stowey (1601).

**R. & H. C.**—R. BICKLE, Bradstone Hall, Tavistock, **Corrector** (2738), 3 y., 4 m., 3 w.; s., Fancy's Robin 2nd (1966), d., Countess 2nd (5958); s. of d., Narcissus (1617).

**C.**—J. C. WILLIAMS, M.P., Werrington Park, Launceston, **Marmion** (2642), 3 y., 4 m., 4 w.; s., Mario (2279); d., Mouse (clxxxii); s. of d., Druid (1317);—J. C. WILLIAMS, M.P., Caerhays Castle, St. Austell, **Doncaster** (2750), 3 y., 4 m., 2 w., 1 d.; s., Duke of Flitton 17th (1544); d., Dowager (8784); s. of d., Bravo (1686).



**CLASS 23.—Devon Bull, calved in 1891. [5 entries.]**

**I. (£15).**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, Somerset, **Compensator** (2942), 2 y.; s., Baron Gulsoncott 4th (2193); d., Grape 4th (9820); s. of d., Lord Currypool (1589).

**II. (£10).**—H. B. BLACKBURN, Townleigh, Lew Down, Devon, **Bungy** (2933), 2 y., 1 w., 6 d.; s. Lovely Laddie (2612); d., Brenton 6th (9994); s. of d., Duke of Flitton 15th (1542).

**B. & H. C.**—P. H. TAMLYN, Boode House, Braunton, N. Devon. **Welcome**; s., Primrose Duke (2296); d., Primrose (9164); s. of d., Monarch (2090).

**H. C.**—J. HATTIN, Manor Farm, Thorne St. Margaret, **Robin Hood 2nd**, 1 y., 11 m., 2 w.; bred by J. Farthing, Currypool, Bridgwater; s., Baronet (1897); d., Robin's Duchess 3rd (6293); s. of d., Royal Duke (1640).

**C.**—W. TRICK, Flitton Barton, North Molton, **Fisherman** (2977), 2 y., 2 m., 4 w., 2 d.; bred by Sir W. Williams, Barnstaple; s. Freshman (2778); d., Cheerful; s. of d., Earl of Dodington (1725).

**CLASS 24.—Devon Bull, calved in 1892. [7 entries.]**

**I. (£15).**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, Somerset, **Lord Punchard**, 1 y., 4 m., 2 w., 3 d.; bred by the executors of the late W. H. Punchard, Bourton Hall, Totnes; s. Lord Wolseley (2063); d., Lady Jane (10,373); s. of d., Champion (1696).

**II. (£10).**—Sir W. WILLIAMS, Bart., Heanton, Barnstaple; 11 m., 2 w.; s., Pretty Middling; d., Rosebud 4th; s. of d., Foreman 2nd.

**III. (£3).**—J. C. WILLIAMS, M.P., Caerhays Castle, St. Austell, **Card-sharper**, 1 y., 4 m., 2 w.; s., Marmaduke (2280); d., Careful Maid (7977); s. of d., Tempter (1851).

**B. & H. C.**—Col. T. DAVISON, Copse Hill, Bourton-on-the-Water, Gloucestershire, **Garnet**, 1 y., 1 m., 2 w., 2 d.; s., Lord Wolseley (2063); d., Lady 10th (9125); s. of d., Lord Clyst (2021).

**C.**—Sir W. WILLIAMS, Bart.; s., Captain; d., Frolicsome 4th; s. of d., Sir Michael.

**CLASS 25.—Devon Cow, in-Milk or in-Calf, calved before 1890.**

[2 entries.]

**I. (£15).**—Sir W. WILLIAMS, Bart., Heanton, Barnstaple, N. Devon, **Graceful 2nd**, 5 y., 1 m., 3 w.; s., Foreman 2nd; d., Graceful; s. of d., Napoleon 1st.

**II. (£10.\*).**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, **Duchess 17th** (8988), 6 y., 11 m., 2 w., 3 d.; s., Lord Currypool (1589); d., Duchess 7th (5260); s. of d., Duke of Farrington (1323).

**CLASS 26.—Devon Heifer, in-Milk or in-Calf, calved in 1890.**

[3 entries.]

**I. (£15).**—Sir W. WILLIAMS, Bart., Heanton, Barnstaple, **Flame 4th**, 3 y., 5 d.; s., Captain; d., Flame; s. of d., Duke of Flitton 17th.

\* Specially recommended.

**II. (£10.)**—E. J. STANLEY, M.P., Quantock Lodge, Bridgwater, **Moss Rose 15th** (11,757), 3 y., 1 m., 3 w., 6 d.; s., Tempter 2nd (2153); d., Moss Rose 12th (9864); s. of d., Royal Sam (2122).

**R. & H. C.**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, Somerset, **Duchess 29th** (11,727), 2 y., 9 m., 4 d.; s., Baron Golsoncott 4th (2193); d. Duchess 17th (8988); s. of d., Lord Currypool (1589).

**CLASS 27.—Devon Heifer, calved in 1891. [2 entries.]**

**I. (£10.)**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, **Fancy 17th** (12,430), 2 y., 4 m., 6 d.; s., General Gordon (1974); d., Fancy 7th (8991); s. of d., Lord Currypool (1389).

**II.\* (£5.)**—E. J. STANLEY, M.P., Quantock Lodge, Bridgwater, **Princess Margaret**, 2 y., 1 m., 3 w., 2 d.; s., Baronet (1897); d., Princess (9099); s. of d., General Colley (1564).

**CLASS 28.—Devon Heifer, calved in 1892. [6 entries.]**

**I. (£10.)**—Sir W. WILLIAMS, Bart., Heanton, Barnstaple, **Fiction 5th**, 1 y., 4 m., 2 w., 4 d.; s., Pretty Middling; d., Fiction 2nd; s. of d., Foreman 2nd.

**II. (£5.)**—J. HATTIN, Manor Farm, Thorne, St. Margaret, **Pearl**, 1 y., 3 m., 2 w., 3 d.; s., Currypool 2nd; d., Pink; s. of d., Baron Golsoncott.

**III. (£3.)**—J. C. WILLIAMS, M.P., Caerhays Castle, St. Austell, **Pink 17th**, 1 y., 4 m., 3 w., 6 d.; s., Marmaduke (2280); d., Pink 13th (7992); s. of d., Duke of Flitton 17th (1544).

**R. & H. C.**—Sir W. WILLIAMS, Bart., **Fancy 8th**, 1 y., 1 m.; s., Pretty Middling; d., Fancy 4th; s. of d., Foreman 2nd.

**C.**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, **Myrtle 41st** (13,084), 11 m., 1 w., 2 d.; s., Masterpiece (2837); d., Myrtle 28th (9836); s. of d., Lord Currypool (1589):—E. J. STANLEY, M.P., Quantock Lodge, Bridgwater, **Famous 3rd**, 1 y., 1 m., 3 d.; s., Moss Rose's Colley (2093); d., Famous 1st (9861); s. of d., Morning Star (2092).

**SHORTHORN.**

**CLASS 29.—Shorthorn Bull, calved in 1889 or 1890. [11 entries.]**

**I. (£15.)**—C. W. BRIERLEY, The Lydiates, Brimfield, R.S.O., roan, **Stanley**, 3 y., 4 m., 4 w., 2 d., bred by A. Ritson, Micklethwaite, Wigton; s., Master of Teesdale (59,458); d., Lady 15th.

**II. (£10.)**—G. F. KING, Elm Park Farm, Chewton Keynsham, roan, **Blair Athol** (60,367), 3 y., 1 m., 3 w., 4 d., bred by W. Duthie, Collynie, N.B.; s., Bendigo (56,935); d., Bridget; s. of d., Comet (41,250).

**III. (£5.)**—J. HANDLEY, Green Head, Milnthorpe, Westmoreland, red, **St. Clair** (61,742); 3 y., 11 m., 4 w., 1 d., bred by A. Scott, Towie Barclay, Aberdeen; s., Hercules (54,424); d., Japonica 3rd; s. of d., Marcus (51,709).

**R. & H. C.**—THE MARQUIS OF BUTE, K.T., Home Farm, Cardiff, roan, **Unionist**, 4 y., 3 w., 5 d., bred by T. H. Hutchinson, Manor House,

\* Specially recommended.

Catterick; s., King Rudolf (48,110); d., Angelica 9th; s. of d., William of Orange (50,694).

**H. C.**—F. W. BOND, Wargrave Manor, Henley-on-Thames, roan, **Rosedale Farmer**, 2 y., 8 m., 2 w., 4 d., bred by C. W. Brierley, Rosedale, Tenbury; s., Bangle (58,406); d., May Carew (vol. xxxvi. p. 303); s. of d., Baronet (52,459).

**CLASS 30.—Shorthorn Bull, calved in 1891. [10 entries.]**

**I. (£15), and Champion (£10.\*)**—R. STRATTON, The Duffryn, Newport, Mon., roan, **Hornblower** (62,724), 1 y., 11 m., 3 w., 6 d.; s., Medallion (56,175); d., Timbrel 5th; s. of d., Roan Seal (43,955).

**II. (£10.)**—J. D. WILLIS, Bapton Manor, Codford, Wilts, roan, **Prince Stephen**, 1 y., 6 m., 6 d.; s., King Stephen (46,559); d., Cineraria; s. of d., Commodore (54,118).

**III. (£5.)**—W. ATKINSON, Overthwaite, Milnthorpe, roan, **Asteriak** (62,094), 2 y., 2 m., 5 d., bred by A. M. Gordon, Newton, Luch, Aberdeenshire; s., Star of Morning (58,189); d., Actress; s. of d., Actor (45,840).

**R. & H. C.**—C. W. BRIERLEY, The Lydiates, Brimfield, R.S.O., red and white, **Rosedale George**, 2 y., 4 m., 1 w., 3 d.; s. Martinet (59,455); d., Jubilee Georgie; s. of d., Uncle Ben (47,184).

**C.**—J. HOWELL, Green Farm, Saintwell, near Cardiff, roan, **Royal Gwynne**, 2 y., 2 m., 2 w., 3 d.; s., Royal Butterfly Duke 2nd (56,454); d., Cymro Gwynne 3rd; s. of d., Heathfield (55,852).

**CLASS 31.—Shorthorn Bull, calved in 1892. [9 entries.]**

**I. (£15) and R. for Champion.\***—J. D. WILLIS, Bapton Manor, Codford, Wilts, red and white, **Czarowitz**, 1 y., 4 m., 2 w., 4 d.; s., Count Lavender (60,545); d., Crown Princess; s. of d., Golden Crown (54,370).

**II. (£10.)**—J. HANDLEY, Green Head, Milnthorpe, Westmoreland, roan, **Royal Harbinger**, 1 y., 4 m., 3 w., 3 d.; s., Duke of Fife (58,805); d., Lady Percy 2nd; s. of d., Golden Hind 2nd (57,392).

**III. (£3.)**—J. D. WILLIS, roan, **Western Prince**, 1 y., 2 m., 3 w., bred by P. Blundell, Kirkham, Lancashire; s., Fair Trade (55,709); d., Western Maid; s. of d., Kirklevington de Vere (52,083).

**R. & H. C.**—G. F. KING, Elm Park Farm, Chewton Keynsham, roan, **Lord Meldrum**, 1 y., 3 w., 6 d.; s., Blair Athol (60,367); d., Favourite's Duchess; s. of d., Knightley (57,540).

**C.**—LORD FITZHARDINGE, Berkeley Castle, Gloucestershire, red and white, **Dolphin**, 8 m., 1 d.; s., Leonidas; d., Dowager 11th; s. of d., Prince Airdrie (48,472);—and his roan, **Lord Dorset**, 8 m., 2 w., 6 d.; s., Leonidas (59,260); d., Dowager 7th; s. of d., Kirklevington Emperor 2nd (45,002).

**CLASS 32.—Shorthorn Cow, in-Milk or in-Calf, calved before 1890. [9 entries.]**

**I. (£15.)**—C. W. BRIERLEY, The Lydiates, Brimfield, R.S.O., roan, **Grace Darling**, 4 y., 7 m., 1 w., 2 d., bred by R. Stratton, The Duffryn, Newport, Mon.; s., Signet (55,037); d., Grace Gazell; s. of d., Rowfant Duke of Oxford (43,926).

\* Given by the Gloucester Local Committee, for the best Shorthorn Bull in any of the Classes.

**II. (£10.)**—G. HARRISON, Underpark, Lealholm, Grosmont, Yorkshire, ed, **Forest Rose**, 6 y., 1 m., 2 w., bred by Messrs. Lyle, Donaghmore, co. Tyrone; s., King of the Forest (54,497); d., Forest Elf; s. of d., A1 (42,636).

**III. (£3.)**—C. T. STEVENS, Ranbury, near Fairford, Gloucester, red and white, **Crocea 19th**, 7 y., 4 m., 3 w., 5 d., bred by the late J. C. Croome, Bagenden House, Cirencester; s., Wellington 3rd (50,651); d., Crocea 7th; s. of d., Lord Gifford 3rd (43,514).

**R. & H. C.**—J. BENNETT, Down House, Dursley, **Princess**, 6 y.

**CLASS 33.—Shorthorn Heifer, in-Milk or in-Calf, calved in 1890.**

[5 entries.]

**I. (£15)** and **R. for Champion.\***—C. W. BRIERLEY, The Lydiates, Brimfield, R.S.O., red and white, **Rosedale Georgie**, 3 y., 4 m., 3 w., 4 d.; s., Martinet (59,455); d., Jubilee Georgie; s. of d., Uncle Ben (47,184).

**II. (£10.)**—J. D. WILLIS, Bapton Manor, Codford, Wilts, red and white, **Golden Mary 2nd**, 3 y., 2 m., 1 w., 5 d., bred by W. Duthie, Collynie, N.B.; s., Calderwood (57,010); d., Marigold 25th; s. of d., Elocutionist (47,832).

**III.† (£3.)**—C. W. BRIERLEY, roan, **Princess**, 3 y., 1 m., 3 w., 3 d., bred by B. H. Allen, Clifford Priory, R.S.O.; s., Laughton Earl 7th (56,003); d., Pink; s. of d., Hayle (43,345).

**R. & H. C.**—G. and H. BICKFORD, Paradise Coven, near Wolverhampton, roan, **Rosedale Fairy**, 2 y., 8 m., 3 w., 3 d., bred by C. W. Brierley, The Lydiates, Brimfield, R.S.O.; s., Martinet (59,455); d., Lady Dennison 5th; s. of d., Prince of Geneva 16th (42,196).

**C.**—THE MARQUIS OF BUTE, K.T., Home Farm, Cardiff, red, **Blanchette 4th**, 3 y., 2 m., 3 w., 6 d.; s., Lord Granville; d., Thorndale Blanche 3rd; s. of d., Erin Wild Duke (51,224).

**CLASS 34.—Shorthorn Heifer, calved in 1891. [14 entries.]**

**I. (£10)** and **Champion (£10.\*)**—R. STRATTON, The Duffryn, Newport, Monmouth, roan, **Timbrel 23rd**, 2 y., 2 m., 5 d.; s., Medallion (56,175); d., Timbrel 12th; s. of d., Victor (52,297).

**II. (£5.)**—J. D. WILLIS, Bapton Manor, Codford, Wilts, red, **Jessamine**, 2 y., 1 m., 2 w., 4 d.; s., Captain of the Guard (68,596); d., Japonica; s. of d., General Gourka (39,922).

**III. (£3.)**—G. HARRISON, Underpark, Lealholm, Grosmont, Yorkshire, roan, **Warfare**, 2 y., 4 m., 1 w., bred by — Campbell, Kinellar, Aberdeenshire; s., First Consul (57,314); d., Roan Rosebud 1st; s. of d., Gravesend (46,461).

**R. & H. C.**—C. W. BRIERLEY, The Lydiates, Brimfield, R.S.O., red and white, **Rosedale Cowslip**, 1 y., 9 m., 3 w., 6 d.; s., Weal King's Farewell (60,159); d., Cowslip; s. of d., Javelin (46,530).

**C.**—Sir H. VIVIAN, Bart., M.P., Park-le-Breos, Swansea, red, **Grand Duchess 65th**, 1 y., 10 m., 3 w., 1 d.; s., Waterloo de Breos 5th (61,976); d., Grand Duchess 62nd; s. of d., Grand Duke of Geneva 3rd (49,677):—

\* Given by the Gloucester Local Committee for the best Shorthorn Cow or Heifer in any of the Classes.

† Specially recommended.

F. W. BOND, Wargrave Manor, Henley-on-Thames, roan, **Gertrude 2nd**, 2 y., 2 m., bred by B. H. Allen, Clifford Priory; s., Rissington Prince (59,760); d., Gertrude (vol. xxxii. p. 211); s. of d., Hayle (43,345):—and H. T. COOKSON, Sturford Mead, Warminster, roan, **Crest**, 2 y., 2 m., 2 w., bred by W. Duthie, Collynie, Aberdeen; s., Roan Robin (57,992); d., Monogram 30th; s. of d., Lord Lovell (48,213).

**CLASS 35.—Shorthorn Heifer, calved in 1892. [13 entries.]**

**I. (£10).**—THE MARQUIS OF BUTE, K.T., Home Farm, Cardiff, roan, **Minstrel Girl**, 1 y., 5 m.; s., Unionist (60,093); d., Music; s. of d., Prince of Cardiff.

**II. (£5).**—J. D. WILLIS, Bapton Manor, Codford, Wilts, red, **Sensation**, 1 y., 2 m., 3 w., 5 d.; s., Count Lavender (60,545); d., Seraphina 2nd; s. of d., Field Marshall (47,870).

**III. (£3).**—J. D. WILLIS, roan, **Jilt**, 1 y., 3 m., 1 w., 3 d.; s., Count Lavender (60,545); d., Jealousy 14th; s. of d., Prince Fred of Cambridge (29,621).

**R. & H. C.**—THE MARQUIS OF BUTE, K.T., roan, **Welsh Maid**, 1 y., 2 m.; s., Unionist (60,093); d., Roan Butterfly's Duchess 7th; s. of d., Baron Oxford 3rd.

**R. C.**—LORD TREDEGAR, Tredegar Park, Newport, Mon., roan, **Lucy Grey 9th**, 1 y., 3 m., 1 w., 4 d.; s., Jupiter (57,508); d., Lucy Grey 5th; s. of d., Bellerophon (47,472):—and J. HOWELL, Green Farm, Saintwell, near Cardiff, roan, **Sunshine**, 1 y., 3 m., 4 w.; s., Duke of Barrington 31st (58,783); d., Sunbeam 2nd; s. of d., Royal Butterfly Duke 2nd (56,454).

**HEREFORD.**

**CLASS 36.—Hereford Bull, calved in 1889 or 1890. [2 entries.]**

**I. (£15).**—J. H. ARKWRIGHT, Hampton Court, Leominster, **Rose Cross 2nd** (14,865), 4 y., 4 m., 1 w., 1 d.; s., Iroquois 3rd (13,147); d., Curly 23rd; (vol. xviii., p. 215); s. of d., Rose Cross (7237).

**II.\* (£10).**—A. E. HUGHES, Wintercott, Leominster, **Albion** (15,027), 3 y., 4 m., 3 w., 5 d., bred by N. F. Moore, Sutton, Hereford; s., Bruce (13,646); d., Milenda; s. of d., Recorder (7205).

**CLASS 37.—Hereford Bull, calved in 1891. [5 entries.]**

**I. (£15).**—EARL OF COVENTRY, Croome Court, Worcester, **Corydon**, 2 y., 4 m., 3 d.; s., Rare Sovereign (10,499); d., Chaplet; s. of d., Adonis (10,926).

**II. (£10).**—J. H. ARKWRIGHT, Hampton Court, Leominster, **Happy Hampton** (16,097), 2 y., 4 m., 1 w., 2 d.; s., Hilarity (8734); d., Pearl 9th (vol. xx., p. 179); s. of d., Good Boy (7668).

**R. & H. C.**—H. W. TAYLOR, Showle Court, Ledbury, **Astrakhan** (15,833), 2 y., 3 m., 4 w., 1 d.; s., Cavalier (9682); d., Echo; s. of d., Franklin (6961).

**C.**—R. KEENE, Llanvihangel Court, Chepstow, **Ruler**, 2 y., 4 m., 3 w.; s., Pembridge (10,387); d., Blanche 2nd; s. of d., Return (6639).

\* Specially recommended.

**CLASS 38.—Hereford Bull, calved in 1892. [5 entries.]**

**I. (£15).**—A. E. HUGHES, Wintercott, Leominster, **Leadon**, 1 y., 2 m.; s., Seabreeze (14,153); d., Lofty; s. of d., Rudolph (6660).

**II. (£10).**—EARL OF COVENTRY, Croome Court, Worcester, **Reveller**, 4 y., 4 m., 3 w.; s., Senator (14,896); d., Respite; s. of d., Adonis (10,926).

**R. & H. C.**—T. FENN, Stonebrook House, Ludlow, **Downton Model**, 1 y., 3 m., 1 w.; s., Jubilant (15,405); d., Prospera (vol. xxi., p. 341); s. of d., Bourton (11,005).

**C.**—R. PALMER, Lodge Farm, Nazeing, Waltham Cross, Essex, **Squarey**, 1 y., 4 m., 2 w., 1 d.; s., Crown Prince (8464); d., Dunbird; s. of d., Rose Stock (6651);—and his **Punch**, 1 y., 4 m., 1 w., 6 d.; s., Prince Rudolph (14,056); d., Lollipop; s. of d., Crown Prince (8464).

**CLASS 39.—Hereford Cow, in-Milk or in-Calf, calved before 1890. [4 entries.]**

**I. (£15).**—T. FENN, Stonebrook House, Ludlow, **Downton Hermia**, 1 y., 2 m., 1 w., 5 d.; s., Bourton (11,005); d., Hermia (vol. xviii., p. 467); s. of d., Defender (5866).

**II. (£10).**—EARL OF COVENTRY, Croome Court, Worcester, **Ranee**, 4 y., 1 m., 1 w., 3 d.; s., Rare Sovereign (10,499); d., Rarity 13th; s. of d., Archduke (4312).

**R. & H. C.**—EARL OF LISBURN, Crosswood, Aberystwith, **Wild Cherry**, 1 y., 3 m., 1 w., 5 d., bred by A. R. Boughton Knight, Downton Castle, Ludlow; s., Lord Derby (11,410); d., Brockton Cherry (vol. xviii., p. 463); s. of d., Brockton (6324).

**H. C.**—T. FENN, **Fine Lady**, 3 y., 6 m., 2 w.; s., Bourton (11,005); d., Bit of Fashion (vol. xvi., p. 370); s. of d., Auctioneer (5194).

**CLASS 40.—Hereford Heifer, in-Milk or in-Calf, calved in 1890. [2 entries.]**

**I. (£15).**—R. GREEN, The Whittern, Kington, Herefordshire, **Perilla**, 3 y., 1 m., 3 w., 2 d.; s., Whittern Grove (10,843); d., Miss Perfection; s. of d., Lord Wilton (4740).

**R. & H. C.**—Col. BRIDGFORD, C.B., Kinnersley, near Hereford, **Sybil**, 3 y., 1 m., 3 w.; s., Torro (7313); d., Dairymaid; s. of d., Ruby (6659).

**CLASS 41.—Hereford Heifer, calved in 1891. [5 entries.]**

**I. (£10).**—R. EDWARDS, The Sheriffs, Kington, Herefordshire, **Cocoon**, 2 y., 4 w.; s., Shaftesbury (11,676); d., Sheriff's Collina; s. of d., Magnet (8873).

**II. (£5).**—N. F. MOORE, Sutton, near Hereford, **Magic**, 2 y., 4 m., 3 w., 4 d.; s., Ivanhoe (13,150, H.H.B.); d., Milenda (vol. xix., p. 504, H.H.B.); s. of d., Recorder (7205, H.H.B.).

**R. & H. C.**—R. GREEN, The Whittern, Kington, Hereford, **Rachel**, 2 y., 3 m., 3 w., 1 d., bred by G. Child, Court of Noke, Pembridge; s., Cleveand (13,696); d., Lydia; s. of d., Warrior True (10,804).

**H. C.**—**EARL OF COVENTRY**, Croome Court, Worcester, **Varnisha II.**, 2 y., 1 m., 1 d.; s., Senator (14,896); d., Varnish; s. of d., Adelbert (8185);—**Col. BRIDGFORD**, C.B., Kinnersley, Hereford, **Princess II.**, 2 y., 1 m., 3 w., 4 d.; s., Byron (13,656); d., Peerless; s. of d., Torro (7313).

**CLASS 42.—Hereford Heifer, calved in 1892. [15 entries.]**

**I. (£10).**—**R. KEENE**, Llanvihangel Court, Chepstow, **Blanche Pembridge**, 1 y., 4 m., 3 w., 5 d.; s., Pembridge (10,387); d., Blanche 2nd; s. of d., Return (6639).

**II. (£5).**—**J. H. ARKWRIGHT**, Hampton Court, Leominster, **Pearl 11th**, 1 y., 3 m., 4 w., 2 d.; s., Rose Cross 2nd (14,865); d., Pearl 8th (vol. xx., p. 179); s. of d., Hilarity (8734).

**III. (£3).**—**R. O. REES**, Bronllys Court, Talgarth, Brecknock, **Marion**, 1 y., 4 m., 2 w., 5 d.; s., Lulham (13,234); d., Mabel (15-78); s. of d., Romulus (5543).

**IV.\* (£2).**—**H. W. TAYLOR**, Showle Court, Ledbury, **Tweenie**, 1 y., 1 m., 4 w., 1 d.; s., Reality (14,823); d., Marigold; s. of d., Franklin (6961).

**R. & H. C.**—**N. F. MOORE**, Sutton, Hereford, **Sutton Belle**, 1 y., 4 m., 2 d.; s., Grenadier (10,622, H.H.B.); d., Venus (vol. xxi., p. 496, H.H.B.); s. of d., Senator (7251, H.H.B.).

**H. C.**—**EARL OF COVENTRY**, Croome Court, Worcester, **Rose**, 1 y., 3 m., 3 w., 2 d.; s., Rare Sovereign (10,499); d., Rosemary; s. of d., Grove 3rd (5051).

**C.**—**EARL OF COVENTRY**, **Geneva**, 1 y., 1 m., 3 d.; s., Royal Ruler (13,406); d., Gare-a-vous; s. of d., Adonis (10,926);—**T. FENN**, Stonebrook House, Ludlow, **Downton Heiress**, 1 y., 2 m., 1 w., 4 d.; s., Viscount Wilton (11,824); d., Downton Hermia; s. of d., Bourton (11,005);—**R. O. REES**, **Dorothy**, 1 y., 4 m., 3 w., 1 d.; s., Lulham (13,234), d., Water Lily (22,622); s. of d., Bacho (5732);—and **H. W. TAYLOR**, **Fatima**, 1 y., 3 m., bred by J. Rankin, M.P., Bryngwyn, Hereford; s., Royalist (14,124); d., Fairlike; s. of d., Montalembert (6075).

**SUSSEX.**

**CLASS 43.—Sussex Bull, calved in 1889 or 1890. [5 entries.]**

**I. (£15).**—**W. S. FORSTER**, Gore Court, Maidstone, **Gondolier** (1001); 4 y., 1 m., 1 w., 5 d.; s., Careful (741); d., Tidy; s. of d., Barton.

**II. (£10).**—**J. GODMAN**, Park Hatch, Godalming, **Goldlink** (1099), 3 y., 3 m., 4 w., 2 d.; s., Gold (815); d., Noble Lady (2911); s. of d., Napoleon 3rd (396).

**III.\* (£5).**—**G. WARDE**, West Farleigh, near Maidstone, **Dog Rose** (1086), 2 y., 10 m., 2 w., 3 d., bred by W. S. Forster, Gore Court, Maidstone; s., Mikado (705); d., Rosebud 1st (3825); s. of d., Frankenstein 2nd (328).

**H. C.**—**W. WOOD**, junr., Hassocks, Sussex, **Tosser**, 3 y., 10 m., 3 w., 4 d., bred by W. S. Forster, Gore Court, Maidstone; s., Mikado (705); d., Prebble A 3 (3319); s. of d., Beckley Bull (241).

**C.**—**P. SAILLARD**, Buchan Hill, Crawley, Sussex, **Silversmith 2nd** (1115), 3 y., 5 m., bred by J. S. Hodgson, Lythe Hill, Haslemere; s., Silversmith (849); d., Laura 7th (3268); s. of d., Lord Oxford (461).

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\* Specially recommended.

**CLASS 44.—*Sussex Bull, calved in 1891.* [4 entries.]**

**I. (£15.)**—J. S. HODGSON, Lythe Hill, Haslemere, Surrey, **Headley**, 2 y., 4 m., 1 w., 2 d.; s., Dog Daisy; d., Young Emily 1st (3622); s. of d., Prince Alfred (555).

**II. (£10.)**—J. GODMAN, Park Hatch, Godalming, **Oxford Duke 6th** (1188), 2 y., 2 w., 1 d.; s., Oxford Duke 4th (1014); d., Noble Lady 3rd (4097); s. of d., Goldboy (541).

**R. & H. C.**—W. WOOD, junr., Hassocks, Sussex, **Jubilee 2nd**, 2 y., 2 m., 1 w., 4 d.; s., Jubilee (826); d., Dennett's Wantley (4906); s. of d., Dennett's Bull (1018).

**C.**—EARL OF DERBY, Birtley, Witley, Surrey, **Gladiator** (1171), 2 y., 3 m., 2 w., 2 d.; s., Jubilee (826); d., Gladsome 3rd (4008); s. of d., Oxford 2nd (771).

**CLASS 45.—*Sussex Bull, calved in 1892.* [3 entries.]**

**I. (£15.)**—EARL OF DERBY, Birtley, Witley, Surrey, **Proud Prince**, 1 y., 4 m., 1 w., 5 d.; s., Dog Daisy (1112); d., Pride of the Family 2nd (2469); s. of d., Young Hartley (444).

**II. (£10.)**—J. GODMAN, Park Hatch, Godalming, Surrey, **King John 2nd**, 1 y., 3 m., 2 w.; s., King John (1100); d., Noble Lady 5th (4419); s. of d., Nobleman (707).

**R. & H. C.**—W. S. FORSTER, Gore Court, Maidstone, **Chevalier**, 1 y., 4 m., 5 d.; s., Gondolier (1001); d., Pretty Maid VI. (3563); s. of d., Honest Boy (544).

**CLASS 46.—*Sussex Cow, in-Milk or in-Calf, calved before 1890.*  
[1 entry.]**

**I. (£15.)**—W. S. FORSTER, Gore Court, Maidstone, **Black Eyes** (4388), 4 y., 9 m., 3 w., 5 d.; s., Goldsmith (391); d., Surprise (3116); s. of d., Archduke (381).

**CLASS 47.—*Sussex Heifer, in-Milk or in-Calf, calved in 1890.*  
[2 entries.]**

**I. (£15.)**—J. GODMAN, Park Hatch, Godalming, **Comely 10th** (5070), 2 y., 4 m., 3 w.; s., Nobleman (707); d., Comely 9th (3682); s. of d., Goldboy (541).

**II. (£10.\*)**—EARL OF DERBY, Birtley, Witley, Surrey, **Lady Napier 2nd** (5185), 2 y., 10 m., 4 d., bred by C. T. Lucas, Warnham Court, Horsham; s., Lover (1149); d., Lady Napier (5184); s. of d., Earl of Magdala 2nd (585).

**CLASS 48.—*Sussex Heifer, calved in 1891.* [3 entries.]**

**I. (£10.)**—W. S. FORSTER, Gore Court, Maidstone, **Crown Princess** (5483), 2 y., 3 m., 4 d.; s., Mikado (705); d., Princess 2nd (3325); s. of d., Pacific (514).

**II. (£5.)**—J. GODMAN, Park Hatch, Godalming, **Gentle 15th** (5508), 2 y., 4 m. 5 d.; s., Gold (815); d., Gentle 4th (2601); s. of d., Tavistock (376).

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\* Specially recommended.



**III.\* (£3).**—W. S. FORSTER, **Foxglove** (5484), 2 y., 4 m., 1 w., 4 d.; s., Oxford Duke 1st (840); d., Rosemary (4381); s. of d., Careful (741).

**CLASS 49.—Sussex Heifer, calved in 1892. [5 entries.]**

**I. (£10).**—W. S. FORSTER, Gore Court, Maidstone, **Flo**, 1 y., 4 m., 4 w., 2 d.; s., Gondolier (1001); d., Wadhurst Marigold (5050); s. of d., Lord Charles.

**II. (£5).**—J. GODMAN, Park Hatch, Godalming, **Dahlia 8th**, 1 y., 4 m., 2 w., 1 d.; s., King John (1100); d., Dahlia 7th (4736); s. of d., Oxford Duke (708).

**R. & H. C.**—EARL OF DERBY, Birtley, Witley, Surrey, **Diamond Reeve**, 1 y., 4 m., 2 w., 3 d.; s., Lord Bacon (974); d., Golden Reeve (4602); s. of d., Goldfinder (821).

**C.**—EARL OF DERBY, **Honey Lass**, 1 y., 4 m., 3 w.; s., Lord Oxeve (954); d., Honey 3rd (3753); s. of d., Percy (712).

**JERSEY.**

**CLASS 50.—Jersey Bull, calved in 1883 or 1890. [6 entries.]**

**I. (£15) & R.** for Champion.†—F. BRADSHAW, Lifton Park, Devonshire, grey, **Grouville's Clyde** (vol. v., p. 254, E.J.H.B.), 3 y., 3 w., 2 d., bred by H. A Blyth, Essex; s., Grouville's Champion (3346, E.J.H.B.); d., Clyde 2nd; s. of d., Rocket (1969, E.J.H.B.).

**II. (£10).**—J. BLYTH, Wood House, Stansted, Essex, fawn, **Distinction's Pride**, 3 y., 3 m., 6 d., bred by F. J. Noel, St. Martin's, Jersey; s., Hillside Lad (3369); d., Distinction (I.H.B., 5519, F.S., H.C.).

**III. (£5).**—G. GREENALL, Walton Hall, Warrington, whole fawn, **Zulu's Pride** (1512, J.H.B.), 3 y., 3 m., 3 w., 3 d., bred by G. Malzard, St. Peter's, Jersey; s., Morier King (1115, J.H.B.); d., Zulu VI. (2964, J.H.B.); s. of d., Pollux (871, J.H.B.).

**R.**—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmund's, dark grey, **Columbus**, 4 y., 3 m., 3 w., bred by F. Renault, St. Mary's, Jersey; s., Blue Prince (J.H.B., 1071, P.S.); d., Clemence (J.H.B., 7353, F.S.).

**CLASS 51.—Jersey Bull, calved in 1891. [13 entries.]**

**I. (£15) & Champion (£10).**†—LORD ROTHSCHILD, Tring Park, Herts, fawn, **Flora's Lad** (D.D.), 2 y., 1 m., 5 d.; s., Fan's Lad (3265); d., Flora 6th; s. of d., Diomed (791).

**II. (£10).**—LORD ROTHSCHILD, bronze, **Spot's Lad** (K.K.), 2 y., 1 m., 3 w., 1 d.; s., Columbus (3184); d., Spot (J.J.H.B., 7437); s. of d., Sir Garnet (J.J.H.B., 405).

**III. (£5).**—J. BLYTH, Wood House, Stansted, Essex, fawn, **Goldfinder**, 2 y., 4 m., bred by J. Luce, St. Lawrence, Jersey; s., May Lad (I.H.B., 1240, P.S.; H.C.); d., Neatness 3rd (I.H.B., 2624, P.S.; H.C.).

**R. & V. H. C.**—G. GREENALL, Walton Hall, Warrington, brown, **Rosa's Fortescue II.** (1686, J.H.B.), 2 y., 4 m., 3 w., 6 d., bred by E. G. Renouf, St. Martin's, Jersey; s., Rosa's Fortescue (1318, J.H.B.); d., Chance Aster (3540, J.H.B.); s. of d., Chancery (999, J.H.B.).

\* Specially recommended.

† Given by the Gloucester Local Committee for the best Jersey Bull in any of the Classes.

**V. H. C.**—H. J. CORNISH, Thornford, Sherborne, Dorset, brown, **Bisarc** (1669, J.H.B., H.C.), 2 y., 4 m., 2 w., 2 d., bred by F. O. D'Auvergne, North Isle, St. Owen's, Jersey; s., May Lad (1240, J.H.B.); d., Whyandotte 393, J.H.B.).

**C.**—J. W. CROOKES, Scuttingham, Sittingbourne, Kent, black, **Daily Telegraph** (B.S.), 2 y.; s., Pomona's Daily (3654); d., Juliette; s. of d., hiva (3427);—J. F. HICKS, Ross House, Redbridge, dark grey, **Dairy ad**, 1 y., 6 m., 3 w., bred by J. T. Michel, Beaumont, St. Peter's, Jersey; s., Lemon's Lad (1329); d., Pride 2nd (569);—and SIR W. G. PEARCE, Bart., P., Chilton Lodge, Hungerford, whole, **Fan's Nero 2nd**, 2 y., 4 m., 3 w., d.; s., Fan's Nero; d., Lotta.

CLASS 52.—*Jersey Bull, calved in 1892.* [17 entries.]

**I. (£15).**—G. GREENALL, Walton Hall, Warrington, brown, **Little Gem** (1828, J.H.B.), 1 y., 2 m., 3 w., 3 d., bred by E. Hubert, St. Owen's, Jersey; s., Golden Fink (1491, J.H.B.); d., Devotion II. (1358, J.H.B.).

**II. (£10).**—H. J. CORNISH, Thornford, Sherborne, Dorset, grey fawn, **Golden Prince**, 1 y., 2 m., 6 d., bred by A. Le Gros, Jersey; s., Golden ad (1242, J.H.B.); d., Leoni (3216, J.H.B.).

**III. (£8).**—LORD ROTHSCHILD, Tring Park, Herts, dark grey, **Columbus 2nd**, 1 y., 1 m., 2 d.; s., Columbus (3184); d., Rosalie; s. of d., Castor J.J.H.B., 870).

**R. & H. C.**—J. R. CORBETT, More Place, Betchworth, Surrey, dark fawn, **Butterboy**, 1 y., 4 m., 5 d.; s., Butterfly; d., Daisy of Rochdale 6th.

**H. C.**—LORD ROTHSCHILD, grey, **Pontorson's Boy**, 1 y., 1 m., 2 w., 5 d.; s., Pandora's Boy (3619); d., Pontorson (J.J.H.B., 1875, P.S.; H.C.); s. of d., Happy Cetewayo (J.J.H.B., 2499);—and for his grey, **Spot's President**, 1 y., 1 m., 4 d.; s., President (3661); d., Spot (J.J.H.B., 7437); s. of d., Sir Garnet (J.J.H.B., 405);—W. E. BUDGETT, Stoke Lodge, Stoke Bishop, near Bristol, grey, **Duke of Cornwall**, 1 y., 2 w., bred by J. Tremayne, Feligan, St. Austell; s., King of Assyria; d., Hollyhock (vol. iv., p. 363); s. of d., Masher (1807);—and Mrs. E. E. STARKIE, Mitchells, Saffron Walden, dark grey, **Fairfay**, 1 y., 4 m., 2 w., 5 d., bred by J. Blampied, St. Lawrence, Jersey; s., Lemon's Lad (1329); d., 3 Oaks Fairy (4024).

**C.**—J. W. CROOKES, Scuttingham, Sittingbourne, dark grey, **Morning Post**, 1 y., 4 m., 4 w., 1 d.; s., Pomona's Daily (3654); d., Clematis (vol. v., p. 235, E.J.H.B.); s. of d., King;—and Mrs. M. CUSTANCE, Brook Heath, Breamore, Salisbury, bronze grey, **Dairy King 4th**, 1 y., 1 m., 2 w., 4 d.; s., Dairy King III. (3200); d., Sybil's Gem; s. of d., Thornford Gem (2943).

CLASS 53.—*Jersey Cow, in-Milk or in-Calf, calved before 1890.*

[29 entries.]

**I. (£15), & Champion (£10).\***—G. GREENALL, Walton Hall, Warrington, broken colour, **Mona 7th**, 4 y., 1 m., 2 w., 4 d., bred by F. P. Hocquoil, St. Owen's, Jersey; s., Leonidas (881, J.H.B.); d., Mona 3rd (1447, J.H.B.); s. of d., Wolseley (401, J.H.B.).

**II. (£10), & R. for Champion.\***—LORD ROTHSCHILD, Tring Park, Herts, creamy fawn, **Spot**, 7 y., 2 m., 1 w., 5 d., bred by J. Le Moignan, St. John's, Jersey; s., Sir Garnet (405); d., Bremen (J.H.B., 4063).

\* Given by the Gloucester Local Committee for the best Jersey Cow or Heifer in any of the Classes.

**III. (£3).**—**LORD ROTHSCHILD**, grey, **Wigton 2nd**, 4 y., 11 m., 3 w., 2 d., bred by A. Gautier, St. Saviour's, Jersey; s., **Count Wolseley** (928); d., **Wigton** (7198), F.S.); s. of d., **Sir Robert** (366, P.S.).

**R. & V. H. C.**—**Mrs. E. E. STARKIE**, Mitchells, Saffron Walden, fawn and white, **Flora's Pearl**, 4 y., 2 m., 4 w., 1 d., bred by C. de Sendry, Le Bannelaïs, Trinity; s., **Standard** (1056); d., **Flora's Pride** (984).

**H. C.**—**LORD ROTHSCHILD**, fawn with little white, **Bay Leaf 4th**, 7 y., 2 m., 3 w., bred by P. Arthur, St. Saviour's, Jersey; s., **Wolseley** (2165); d., **Bayleaf** (J.J.H.B., 3557, F.S.C.):—and his fawn and white, **Clemence 2nd**, 5 y., 3 m., 5 d., bred by F. Renault, St. Mary's, Jersey; s., **Golden King** (955); d., **Clemence** (7353, F.S.):—**W. ARKWRIGHT**, Everleigh Manor, Marlborough, brownish grey, **Scarsdale Liberty**, 4 y., 11 m., 2 w., 2 d., bred by C. A. Balleine, St. Peter's, Jersey; s., **Lord Nelson**, (900, J.H.B.); d., **La Marseillaise** (4378, J.H.B.):—**J. R. CORBETT**, More Place, Betchworth, Surrey, fawn, **Sweet Jessamine**, 6 y., 11 m., 2 w., 3 d., bred by J. Arthur, Jersey; s., **Lord Wolseley**; d., **Jessamine 5th**:—**H. J. CORNISH**, Thornford, Sherborne, Dorset, dark brown, **Rival's Julia 2nd**, 7 y., 11 m., 2 w., 5 d., bred by P. Mourant, St. Saviour's, Jersey; s., **La Commune's Prince** (2584); d., **Rival's Julia** (vol. v., p. 630); s. of d., **Governor 2nd** (1645):—**J. W. CROOKES**, Scuttingham, Sittingbourne, Kent, grey and white **Juliette** (Register No. viii., p. 70), 5 y., 9 m., 1 w., 4 d., bred by P. J. Machin, Trinity, Jersey; s., **Khiva** (3427); d., **Celandine** (3842, F.S.C.):—and his black, **Black Bess 2nd** (vol. v., p. 194), 9 y., 1 m., 3 w., 6 d., bred by J. Arthur, St. Mary's, Jersey:—and **G. GREENALL**, fawn, **La Chasse's Fancy 3rd** (3052, J.H.B.), 5 y., 2 m., 4 w., bred by J. Coutanche, St. John's, Jersey; s., **Lily's Prince** (681, J.H.B.); d., **La Chasse's Fancy** (4211, I.H.B.).

**C.**—**W. ARKWRIGHT**, whole fawn, **Scarsdale Bistre**, 4 y., 3 m., 4 d., bred by F. Rouland, St. Helier's, Jersey; s., **Count Bismarck** (923, J.H.B.); d., **Rosie of Belmont** (2290, J.H.B.); s. of d., **Everton King** (390, J.H.B.):—**J. BLYTH**, Wood House, Stansted, Essex, grey, **Lady Nelson** (vol. v.), 5 y., 3 m., 4 w., bred by P. J. Ahier, St. Helier's, Jersey; s., **Lord Nelson** (3484); d., **Tiny**; s. of d., **Cetewayo 4th** (2316):—and his light fawn, **Hortance**, (vol. v.), 5 y., 3 w., 6 d., bred by F. J. Driscoll, Jersey; s., **Pollux** (3653); d., **Les Champ's Pride** (6837, F.S., H.C.):—**J. F. HICKS**, Ross House, Redbridge, Hants, grey fawn, **Julie Angot**, 4 y., 2 m., 3 w., 5 d., bred by P. Le Moltu, Le Coin, St. Owen's, Jersey; s., **Blue Prince** (1071); d., **Madame Angot** (3237):—and **R. P. WHEADON**, Leicester House, Ilminster, brown, **Matilda Bright**, 5 y., 2 w., 3 d., bred by F. C. Le Sueur, Trinity, Jersey; s., **Butes Fancy** (950, J.H.B.); d., **Miranda Bright**; s. of d., **Darlow**.

**CLASS 54.—Jersey Heifer, in-Milk or in-Calf, calved in 1890.**

[16 entries.]

**I. (£15).**—**G. GREENALL**, Walton Hall, Warrington, brown, **Daisy of the Valley**, 3 y., 3 m., 1 w., 5 d., bred by J. C. Le Sueur, St. Saviour's, Jersey; s., **Count Wolseley** (928, J.H.B.); d., **Beauty of Ogden** (2563, J.H.B.).

**II. (£10).**—**W. ARKWRIGHT**, Everleigh Manor, Marlborough, pale fawn and white, **Scarsdale Florida**, 2 y., 11 m., 3 w., 5 d.; s., **Marmalade** (3515, E.J.H.B.); d., **Scarsdale Monte Carlo** (vol. v., p. 664); s. of d., **Carlo 3rd** (817, J.H.B.).

**III. (£3).**—**J. R. CORBETT**, More Place, Betchworth, Surrey, light fawn, **Stargazer C**, 3 y., 1 w., 6 d.; s., **Franciscan**; d., **Stargazer 4th**; s. of d., **Paron Betchworth**.

**R. & H. C.**—**LORD ROTHSCHILD**, Tring Park, Herts, fawn, **Belle**, 3 y., m., 2 w., 2 d.; s., Trial (J.J.H.B., 1187, H.C.); d., Belle Victorine 3rd; of d., Potsdam (J.J.H.B., 833).

**H. C.**—**LORD ROTHSCHILD**, mulberry, **Crocus**, 3 y., 1 m., 4 d.; s., Count Wolseley (928); d., Tulip (P.S., J.H.B.); s. of d., Sultan's Favourite (873); **W. E. BUDGETT**, Stoke Lodge, Stoke Bishop, near Bristol, black, fawn and white, **Daisy 4th**, 2 y., 7 m.; s., Frivol (2454); d., Daisy 2nd; s. of d., Frangle (3003):—**A. GIBBS**, Tyntesfield, Bristol, grey, **Apothecaire 2nd**, y., 2 m., bred by F. Le Brocq, Jersey; s., Bill Boy (1175, J.H.B.); d., Apothecaire (3110, J.H.B.):—and **W. MADDICK**, Heavitree, Exeter, grey, **Little Jewel 2nd**, 3 y., 4 m., 3 w., 4 d.; s., Badier Grey; d., Little Jewel 1st; s. of d., Daisy's Carlo.

**C.**—**G. GREENALL**, fawn, **Juanita**, 2 y., 5 m., 3 d., bred by T. P. Labbey, Jersey; s., Trial (1187, J.H.B.); d., Sebantu (6281, J.H.B.).

**CLASS 55.—Jersey Heifer, calved in 1891. [20 entries.]**

**I. (£10.)**—**FOWLER AND DE LA PERRELLE**, Southampton, brown, **Golden Drop II.** (J.H.B.), 2 y., 5 m., bred by F. Desmares, Jersey; s., Golden stag (1328, J.H.B.); d., Golden Drop (2448, J.H.B.).

**II. (£5.)**—**Mrs. E. E. STARKIE**, Mitchells, Saffron Walden, dark brown, **Grand Daughter**, 2 y., 1 m., 3 w., 3 d., bred by E. G. de la Perrelle, St. Helier's, Jersey; s., Sir William 2nd (1145); d., Daughter (2911).

**III. (£3.)**—**G. E. SMART**, Combe Hay Park, Bath, whole, **Beatrice**, 2 y., 1 m., 2 d.; s., Jubilee (F.O.); d., Actress, s. of d. Gordon (2482).

**R. & H. C.**—**J. R. CORBETT**, More Place, Betchworth, Surrey, dark fawn, **Mab**, 1 y., 11 m., 3 w., 10 d.; s., Franciscan; d., Mabel III.; s. of d., Baron Betchworth.

**H. C.**—**LORD ROTHSCHILD**, Tring Park, Herts, fawn, **Cupida**, 2 y., 3 w.; s., Columbus (3184); d., Truelove; s. of d., Lord Nelson (D.T.):—and **J. R. CORBETT**, fawn, **Emily** (K.K.), 2 y., 1 d.; s., Dog Rose; d., Emily K.

**C.**—**H. J. CORNISH**, Thornford, Sherborne, Dorset, light brown, **Bona**, 2 y., 1 m., 3 w., 2 d., bred by J. P. Falle, St. Martin's, Jersey; s., Monarch, (1167, J.H.B.); d., Happy Waverley (5423, J.H.B.):—**FOWLER AND DE LA PERRELLE**, fawn, **Fonciere II.** (J.H.B.), 2 y., 5 m., bred by F. Desmares; s., Golden Stag (1328, J.H.B.); d., Fonciere (2286, J.H.B.):—and their grey fawn, **Susie** (J.H.B.), 2 y., 1 m., bred by E. Luce, Jersey; s., Sir William II. (1145, J.H.B.); d., Renarde (3774, J.H.B.):—**G. GREENALL**, Walton Hall, Warrington, fawn, **Rose Adieu**, 2 y., 1 w., 3 d., bred by G. W. Hastings, Great Malvern; s., Conqueror; d., Good Rose; s. of d., Dogmatic:—and **J. F. HICKS**, Ross House, Redbridge, brown, **Rosedale**, 2 y., 1 w., 2 d., bred by F. G. Romeril, St. Lawrence, Jersey; s., William 2nd (1145); d., Duchess 3rd (2043).

**CLASS 56.—Jersey Heifer, calved in 1892. [32 entries.]**

**I. (£10.)**—**LORD ROTHSCHILD**, Tring Park, Herts, grey, **Wigton 5th**, 1 y., 1 m., 2 w., 1 d.; s., Pandora's Boy (3619); d., Wigton 2nd; s. of d., Count Wolseley (928).

**II. (£5.)**—**G. GREENALL**, Walton Hall, Warrington, broken fawn, **Wonder's Queen**, 1 y., 1 w.

**III. (£3.)**—**J. W. CROOKES**, Scuttingham, Sittingbourne, Kent, black, **Summer Number**, 1 y., 1 m., 2 w., 6 d.; s., Pomona's Daily (3654); d., Nora; s. of d., Carlo 3rd.

**R. & V. H. C.**—Mrs. E. E. STARKIE, Mitchells, Saffron Walden, whole, **Marotte**, 11 m., 2 w., 5 d., bred at St. John's College, Cambridge; s., Rosa's Wonder (3728); d. Mamie; s. of d., Castor (3154).

**H. C.**—LORD ROTHSCHILD, fawn, **Jessamine**, 11 m., 3 w., 4 d., bred by J. Brutton, Yeovil; s., Sunbeam (vol. v., p. 602); d., Jealousy; s. of d., Sir William 2nd (3810):—and his fawn, **Gloire de Dijon**, 1 y., 2 d.; s., Rosehill (3732); d., Miss Rosy; s. of d., Rosy's Wonder (835, J.J.H.B., P.S.; H.C.):—J. R. CORBETT, More Place, Betchworth, Surrey, fawn, **Starbright**, 1 y., 2 w.; s., Cloth of Gold; d., Stargazer (C.); s. of d., Franciscan:—J. W. CROOKES, black, **Daily Graphic**, 1 y., 4 m., 3 w., 6 d.; s., Pomona's Daily (3654); d., St. Martin's Choice (vol. v., p. 651); s. of d., Earl of St. Martins:—and G. GREENALL, dark grey, **La Chasse's Surprise**, 1 y., 4 m., 1 w., 6 d., bred by J. G. Helleur, St. Lawrence, Jersey; s., Upland Lad (1456, J.H.B.); d., Curzola II. (1110, J.H.B.).

**C.**—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmunds, fawn, **Clemancy**, 1 y., 11 m., 2 w.; s., Royal Boy (1541); d., Lady Clementine; s. of d., Mourier King (1115):—W. E. BUDGETT, Stoke Lodge, Stoke Bishop, Bristol, fawn, **Spot 4th**, 1 y., 4 m.; s., Marius 2nd (3513); d., Spot 3rd; s. of d., Frivol (2454):—and his fawn, **Rose of Weston 4th**, 1 y., 3 w.; s., Marius 2nd (3513); d., Rose of Weston 3rd (vol. v., p. 641); s. of d., Frivol:—J. R. CORBETT, fawn, **Em**, 1 y., 2 m., 3 w., 6 d.; s., Franciscan; d., Emmie; s. of d., Nestor's Prince:—H. J. CORNISH, Thornford, Sherborne, Dorset, brown, **Classic**, 11 m., 4 w., 2 d.; d., Cassia; s. of d., Nestor 7th (3577):—and J. W. CROOKES, fawn, **Daylight**, 1 y., 4 m., 6 d.; s., Pomona's Daily (3654); d., Roselight (vol. v., p. 476); s. of d., Rosy's Carlo (3736).

#### BUTTER TEST PRIZES.\*

*Cow or Heifer in the Jersey Classes, eligible for the English Jersey Herd Book, yielding the largest quantity of Butter by the practical Test of the Separator and Churn. [10 entries.]*

**I.** (Gold Medal & £3.)—Mrs. E. E. STARKIE, Mitchells, Saffron Walden, fawn and white, **Flora's Pearl**, 4 y., 2 m., 4 w., 1 d., bred by C. de Sendry, Le Bannelais, Trinity; s., Standard (1056); d., Flora's Pride (984).

**II.** (Silver Medal & £3.)—J. R. CORBETT, More Place, Betchworth, Surrey, light fawn, **Stargazer C**, 3 y., 1 w., 6 d.; s., Franciscan; d., Stargazer 4th; s. of d., Baron Betchworth.

**III.** (Bronze Medal & £3.)—Dr. H. WATNEY, Buckhold, Pangbourne, Reading, fawn, **Vesta 2nd**, 7 y., 11 m., 1 w., 4 d., bred by W. H. Champion, Danny, Sussex; s., Goldfield (2480, E.H.B.); d., Vesta (vol. v., p. 736); s. of d., Ford Somers (507).

#### GUERNSEY.

**CLASS 57.**—*Guernsey Bull, calved in 1889 or 1890. [7 entries.]*

**I. (£15) and Champion (£10.†)**—EXPRESS DAIRY Co., LIMITED, College Farm, Finchley, Middlesex, orange fawn, **Alexander the Great**, 3 y., 7 m., bred by Col. Le Mottée, Guernsey; s., Claude (375, P.S.); d., Alexander 3rd (1497, R.G.A.S.).

\* Given by the English Jersey Cattle Society.

† Given by the Gloucester Local Committee for the best Guernsey Bull in any of the Classes.

**II. (£10.)**—J. STEPHENS, Grove House, Finchley, red and white, **May Boy** (346, E.G.H.B.), 4 y., 4 w.; s., Excelsior 8th (138, E.G.H.B.); d., May Flower (230, E.G.H.B.), s. of d., Stanley (96, R.G.A.S.).

**III. (£5.)**—Rev. L. U. JONES, Llandough Rectory, Cardiff, red and white, **Claude 2nd**, 2 y., 11 m., 1 w., 3 d.; bred by T. R. Thompson, Erwr Delyn, near Penarth; s., Claude 1st (298); d., Lady Niby Foley (1081).

**R. & H. C.**—Sir F. A. MONTEFIORE, Bart., Worth Park, Crawley, orange and white, **Sir Francis 2nd** (440), 2 y., 9 m.; s., Loftus (248); d., Laura 3rd (1094).

**CLASS 58.—Guernsey Bull, calved in 1891. [7 entries.]**

**I. (£15.)**—G. LONG, Ogbourne St. Andrew, Marlborough, fawn and white, **Oriole** (494, E.G.H.B.), 2 y., 4 m., 3 w.; s., Original (262, E.G.H.B.); d., Fan 3rd (543, E.G.H.B.); s. of d., Farmer's Pride.

**II. (£10.)**—W. MADDICK, Heavitree, Exeter, yellow and white, **Nimble** (493, E.G.H.B.), 2 y., 1 m., 6 d.; s., Nimble 1st (349, E.G.H.B.); d., Miss Evelyn (1395, E.G.H.B.); s. of d., The Earl.

**III. (£5.)**—Col. H. W. SHAKERLEY, The Hall, Fairlight, Hastings, pale red and white, **Paradox III.** (497), 1 y., 10 m., 4 w., 1 d.; s., Paradox (352); d., Daisy du Hougue du Pommier (1254); s. of d., Golden Fleece.

**R. & H. C.**—Sir F. A. MONTEFIORE, Bart., Worth Park, Crawley, fawn and white, **Lord Worth 2nd**, 1 y., 7 m., 3 w., 5 d.; s., Lord Worth (341); d., Laura 2nd (488).

**CLASS 59.—Guernsey Bull, calved in 1892. [5 entries.]**

**I. (£15.)**—J. STEPHENS, Grove House, Finchley, red and white, **Adonis**, 8 m., 2 w., 6 d.; s., May Boy (346, E.G.H.B.); d., Muriel (1132, E.G.H.B.); s. of d., Climax (14, E.G.H.B.).

**II. (£10.)**—Hon. Mrs. A. B. HAMILTON, Conibs, Stowmarket, red fawn, **Gaza**, 1 y., 1 m., 2 w., 5 d.; s., Sampson (269, E.G.H.B.); d., Florence (119, E.G.H.B.).

**III\* (£3.)**—Hon. Mrs. A. B. HAMILTON, fawn, **Day Star**, 1 y., 2 m., 2 w., 1 d.; s., Sampson (269, E.G.H.B.); d., Day's Eye 3rd (1260, E.G.H.B.); s. of d., Baron Vauxbelets 2nd (126, E.G.H.B.).

**R. & H. C.**—G. LONG, Ogbourne St. Andrew, Marlborough, fawn and white, **Rusticus**, 1 y., 3 m.; s., Emin Pascha (398, E.G.H.B.); d., Bluebell (846, E.G.H.B.).

**CLASS 60.—Guernsey Cow, in-Milk or in-Calf, calved before 1890. [8 entries.]**

**I. (£15) and Champion (£10.†)**—Sir F. A. MONTEFIORE, Bart., Worth Park, Crawley, fawn and white, **Marguerite de Fauxcennaire** (1382), 5 y., 10 m., bred by J. Martin, Guernsey; s., Billy; d., Marguerite de Fauxcennaire (1996, R.G.A.S.).

\* Specially recommended.

† Given by the Gloucester Local Committee for the best Guernsey Cow or Heifer in any of the Classes.

**II. (£10.)**—J. STEPHENS, Grove House, Finchley, orange, fawn and white, **Muriel** (1132, E.G.H.B.), 7 y., 8 m., 2 w., 5 d., bred by H. Abrahams, Brunet, St. Peter's Port, Guernsey; s., Climax (14, E.G.H.B.); d., Whitey (1603, G.H.B.).

**III. (£3.)**—Capt. M. VERSCHOYLE, Springfield, Ross, Herefordshire, whole yellow, **Lady Mildred**, 6 y., 3 m.

**R.**—C. LEE CAMPBELL, Glewstone Court, Ross, fawn, **Buttercup**, 5 y.

**CLASS 61.—Guernsey Heifer, in-Milk or in-Calf, calved in 1890.**  
[8 entries.]

**I. (£15.)**—EXPRESS DAIRY CO., LIMITED, College Farm, Finchley, red and white, **Dairy Queen 4th**, 2 y., 5 m., 2 d.; s. Bonnie Laddie; d., Dairy Queen 3rd.

**II. (£10.)**—Mrs. H. C. STEPHENS, Avenue House, Finchley, fawn and white, **Citron Blossom 4th** (1572, E.G.H.B.), 3 y., 2 m., 4 w., 1 d.; s., Thorn (278, E.G.H.B.); d., Citron Blossom (1243, E.G.H.B.); s. of d., Marcus (36, P.S., R.G.A.S.).

**III. (£3.)**—J. STEPHENS, Grove House, Finchley, orange, fawn and white, **Camelia of Guernsey** (2103, E.G.H.B.), 3 y., 1 m., 1 w., bred by G. Gaudion, Renchier, Guernsey; s., Lord Strangford 2nd (234, G.H.B.); d., Daisy.

**R. & H. C.**—EXPRESS DAIRY CO., LIMITED, orange, fawn and white, **St. Margaret 5th**, 2 y., 5 m.; s., Bonnie Laddie; d., St. Margaret 2nd.

**C.**—J. F. HICKS, Ross House, Redbridge, Hants, fawn, **Rosalind 7th** (3143, P.S., R.G.H.B.), 2 y., 8 m., 3 w., bred by J. W. Martel, Prael, Guernsey; s., Archibald (442, P.S.); d., Rosalind 2nd (2037, P.S.).

**CLASS 62.—Guernsey Heifer, calved in 1891.** [8 entries.]

**I. (£10.)**—FOWLER AND DE LA PERRELLE, Southampton, red and white, **Oasis VI.** (2983, P.S.), 2 y., 2 m., bred by J. Mace, Guernsey; s., Power (602, R.G.H.B.); d., Oasis (378, R.G.H.B.).

**II. (£5.)**—G. LONG, Ogbourne St. Andrew, Marlborough, fawn and white, **Miss Ethel 3rd**, 2 y., 1 m., 2 w.; s., Emin Pasha (398, E.G.H.B.); d., Miss Ethel; s. of d., Baron Vauxbelet.

**III. (£3.)**—J. STEPHENS, Grove House, Finchley, pale red and white, **Muriel IV.** (1984, E.G.H.B.), 1 y., 7 m., 3 w., 1 d.; s., May Boy (346, E.G.H.B.); d., Muriel (1132, E.G.H.B.); s. of d., Climax (14, E.G.H.B.).

**R. & H. C.**—Col. H. W. SHAKERLEY, The Hall, Fairlight, Hastings, pale red and white, **Phoebe**, 2 y., 3 w.; s., Paradox (352); d., Topsy de St. Helene (1197); s. of d., Dick du Beaulieu (G.H.B.).

**H. C.**—Sir F. A. MONTEFIORE, Bart., Worth Park, Crawley, pale red and white, **White Star** (2354), 1 y., 3 m., 3 w., bred by J. Ogier, St. Peter's Port, Guernsey; s., Rouget (531, P.S., R.G.A.S.); d., Hero 2nd (1017, P.S., R.G.A.S.).

**CLASS 63.—Guernsey Heifer, calved in 1892.** [16 entries.]

**I. (£10.)**—Col. H. W. SHAKERLEY, The Hall, Fairlight, Hastings, red, **Doda** (2125), 1 y., 1 w., 1 d.; s., King Dandy (408); d., Lilla (1953); s. of d., Plutarch.

**II. (£5).**—Hon. Mrs. A. B. HAMILTON, Combs, Stowmarket, fawn and white, **Rosemary 2nd**, 1 y., 1 m., 2 w., 5 d.; s., Jesse (328, E.G.H.B.); l., Rosemary (273, E.G.H.B.); s. of d., Loyal (37, E.G.H.B.).

**III. (£3).**—Mrs. H. C. STEPHENS, Avenue House, Finchley, fawn and white, **Citron Blossom VII.** (2111, E.G.H.B.), 9 m., 4 w., 2 d.; s., May Boy (346, E.G.H.B.); d., Citron Blossom IV. (1512, E.G.H.B.).

**R. & H. C.**—G. LONG, Ogbourne St. Andrew, Marlborough, fawn and white, **Evelyn 2nd**, 8 m., 2 w., 5 d.; s., Oriole (494, E.G.H.B.); d., Villacoise 2nd; s. of d., Royaliste (184, R.G.A.S.).

**H. C.**—EXPRESS DAIRY CO., LIMITED, College Farm, Finchley, lemon fawn and white, **Swissville Royal**, 1 y., 1 m., 3 w.; s., Royal Champion; l., Swissville Lass;—and Sir F. A. MONTEFIORE, Bart., Worth Park, Crawley, fawn and white, **Constance of Worth**, 1 y., 1 m., 2 w.; s., Lord Worth (341); d., Esmeralda (751), (late Constance).

**C.**—G. LONG, fawn and white, **Gold Fairy**, 8 m., 3 w., 6 d.; s., Oriole (494, E.G.H.B.); d., Fairy of the Tablons; s. of d., Charley.

*Special Prizes, given by the English Guernsey Cattle Society, for the Best Pair of Guernsey Cows in any of the classes, Silver Cup value 5l.; for the Best Pair of Guernsey Heifers in any of the classes, Silver Cup value 5l.*

Pair of Cows:—Sir F. A. MONTEFIORE, Bart., Worth Park, Crawley, Sussex, fawn and white, **Marguerite de Fauxcennaire** (1382), 5 y., 10 m., bred by J. Martin, Guernsey; s., Billy; d., Marguerite de Fauxcennaire (1996, R.G.A.S.), and fawn and white, **Fortuna** (758, E.G.H.B.), 7 y., 1 m., 2 w., bred by M. A. Rentoul, Junior Carlton Club, London; s., Hopeful (35, E.G.H.B.); d., Blossom (21).

Pair of Heifers:—Mrs. H. C. STEPHENS, Avenue House, Finchley, fawn and white, **Citron Blossom 4th** (1572, E.G.H.B.), 3 y., 2 m., 4 w., 1 d.; s., Phorn (278, E.G.H.B.); d., Citron Blossom (1243, E.G.H.B.); s. of d., Marcus (36, P.S., R.G.A.S.), and fawn and white, **Citron Blossom VII.** (2111, E.G.H.B.), 9 m., 4 w., 2 d.; s., May Boy (346, E.G.H.B.); d., Citron Blossom 4th (1572, E.G.H.B.).

## KERRY.

**CLASS 64.—Kerry Bull, calved in 1890, 1891 or 1892. [5 entries.]**

**I. (£10).**—J. ROBERTSON, The Firs, Hatton, Warwick, **Royal Windsor**, 1 y., 3 m.

**II. (£5).**—M. J. SUTTON, Kidmore Grange, Caversham, Oxon, **Euda's Glory**, 2 y., 1 w., 3 d., bred by Marquess of Lansdowne, Bowood; s., Dan O'Connell (68); d., Euda (368).

**R.**—Rev. H. F. KNIGHTLEY, Wasperton, Warwick, **Kidmore Colorado 2nd**, 2 y., 5 d., bred by M. J. Sutton, Kidmore Grange, Caversham; s., Colorado (63); d., Flora (13); s. of d., Shaun on Scoop.

**CLASS 65.—Kerry Cow or Heifer, in-Milk or in-Calf, of any age. [6 entries.]**

**I. (£10).**—M. J. SUTTON, Kidmore Grange, Caversham, Oxon, **Killarney** (1091), 5 y.



**II. (£5.)**—M. J. SUTTON, **Peep** (732).

**III. (£2.)**—M. J. SUTTON, **Nigella** (689), 7 y.

**R. & H. C.**—M. J. SUTTON, **Violet** (876), 7 y.

**H. C.**—J. ROBERTSON, The Firs, Hatton, Warwick, **Molly**, 4 y., 2 m. bred by J. Robertson, Lamancha, Malahide.

#### DEXTER KERRY.

**CLASS 66.**—*Dexter Kerry Bull, calved in 1890, 1891, or 1892.*

[1 entry.]

**I. (£10.)**—H. SWITHINBANK, Denham Court, Denham, Bucks, red, **Denham Fergus** (37), 2 y., 8 m., 2 w., 2 d.; s., **Limelight** (12); d., Denham Dorothy (54).

**CLASS 67.**—*Dexter Kerry Cow or Heifer, in-Milk or in-Calf, of any age.* [8 entries.]

**I. (£10.)**—H. SWITHINBANK, Denham Court, Denham, Bucks, black, **Denham Dot** (55), 5 y. about.

**II. (£5.)**—H. D. D. BETTERIDGE, Drayton St. Leonards, Wallingford, black, **Moonshine**, 3 y., 11 m., 2 w., bred by Marquis Conyngham, Slane Castle, co. Meath; s., **Sunlight**; d., **Moonstone**.

**III. (£2.)**—J. ROBERTSON, The Firs, Hatton, Warwick, black, **First Love**.

**R. & H. C.**—H. SWITHINBANK, black, **Denham Lady Limerick** (59), 9 y. about.

**C.**—H. D. D. BETTERIDGE, black, **Lobelia**, 7 y. about:—and for his black, **Allydam**, 3 y., 7 m. about.

#### ANY BREED OR CROSS.\*

(In Classes 68, 69 and 70 the quantity and quality of the milk and the date of last calving were taken into consideration.)

**CLASS 68.**—*Pair of Cows, in-Milk.* [1 entry.]

**I. (£15.)**—JOSEPH BENNETT, Down House, Dursley, Gloucestershire, red Shorthorns, 6 y.

**CLASS 69.**—*Cow, in-Milk.* [3 entries.]

**I. (£10.)**—JOSEPH BENNETT, Down House, Dursley, shorthorn, **Violet**, 5 y., bred by — Meredith, Tytherington.

**II. (£5.)**—JOSEPH BENNETT, red and white crossbred, **Filpail**, 7 y.

**CLASS 70.**—*Pair of Heifers, in-Milk, calved in 1890.* [1 entry.]

**I. (£10.)**—JOSEPH BENNETT, Down House, Dursley, shorthorns.

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\* The prizes in Classes 68, 69 and 70 were given by the Gloucester Local Committee, and open only to residents in the county of Gloucester.

## SHEEP.

### LEICESTER.

#### CLASS 71.—*Leicester Shearling Ram.* [7 entries.]

**I. (£10), and R. for Champion.\***—G. HARRISON, Under Park, Lealholm, Grosmont, Yorkshire, 1 y., 3 m.

**II. (£5.)**—G. HARRISON, 1 y., 3 m.

**III. (£2.)**—G. HARRISON, 1 y., 3 m.

**R. & H. C.**—MRS. PERRY-HERRICK, Beau Manor Park, Loughborough, 1 y., 2 m., 2 w.

#### CLASS 72.—*Pair of Leicester Ram Lambs, dropped in 1893.* [4 entries.]

**I. (£10.)**—G. HARRISON, Underpark, Lealholm, Grosmont, Yorkshire, 2 m., 3 w.

**II. (£5.)**—G. HARRISON, 2 m., 3 w.

**R.**—MRS. PERRY-HERRICK, Beau Manor Park, Loughborough, 2 m., 2 w.

#### CLASS 73.—*Pen of Three Leicester Shearling Ewes.* [4 entries.]

**I. (£10.)**—G. HARRISON, Underpark, Lealholm, Grosmont, Yorkshire, 1 y., 2 m., 3 w.

**II. (£5.)**—G. HARRISON, 1 y., 2 m., 3 w.

**R. & C.**—MRS. PERRY-HERRICK, Beau Manor Park, Loughborough, 1 y., 2 m., 2 w.

### COTSWOLD.

#### CLASS 74.—*Cotswold Shearling Ram.* [10 entries.]

**I. (£10), and Champion (£10.\*)**—T. R. HULBERT, North Cerney, Cirencester, 1 y., 3 m.

**II. (£5.)**—R. SWANWICK, Royal Agricultural College Farm, Cirencester, 1 y., 3 m.

**III. (£2.)**—J. MADDOCKS, Glanwarne Court, near Hereford, **William 2nd**, 1 y., 4 m.

**R. & H. C.**—G. BAGNALL AND SON, Westwell, Burford, Oxon, 1 y., 4 m., 1 w., 5 d.

**H. C.**—R. SWANWICK, 1 y., 3 m.

#### CLASS 75.—*Pair of Cotswold Ram Lambs, dropped in 1893.* [4 entries.]

**I. (£10.)**—F. CRADDOCK, Eastington, Northleach, Gloucestershire, 4 m., 2 w.

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\* Given by the Gloucester Local Committee for the best Long-woolled Ram or Ram Lamb in any of the Classes.

**II. (£5.)**—T. R. HULBERT, North Cerney, Cirencester, 3 m.

**R. & H. C.**—T. R. HULBERT, 3 m.

**CLASS 76.**—*Pen of Three Cotswold Shearling Ewes.* [10 entries.]

**I. (£10), and Champion (£10.\*)**—R. SWANWICK, Royal Agricultural College Farm, Cirencester, 1 y., 3 m.

**II. (£5.)**—R. SWANWICK, 1 y., 3 m.

**III. (£2.)**—T. R. HULBERT, North Cerney, Cirencester, 1 y., 3 m.

**R. & H. C.**—R. SWANWICK, 1 y., 3 m.

**H. C.**—G. BAGNALL AND SON, Westwell, Burford, Oxon, 1 y., 4 m.:—and for their 1 y. 4 m.:—and for their 1 y., 4 m.:—T. R. HULBERT, 1 y., 3 m.:—J. MADDOCKS, Glanwarne Court, near Hereford, 1 y., 3 m., 1 w., 6 d.:—and R. SWANWICK, 1 y., 3 m.

### DEVON LONG-WOOL.

**CLASS 77.**—*Devon Long-Wool Shearling Ram.* [17 entries.]

**I. (£10.)**—N. COOK, Chevithorne, Tiverton, Devon, 1 y., 3 m., 3 w.

**II. (£5.)**—N. COOK, 1 y., 4 m.

**III. (£2.)**—Sir J. H. H. AMORY, Bart., Knightshayes Court, Tiverton, 1 y., 3 m.

**R. & H. C.**—J. WHITE, Torweston, Williton, Somerset, 1 y., 2 m.

**H. C.**—Sir J. H. H. AMORY, Bart., 1 y., 2 m., 3 w.:—C. G. THORNE, Curdon, Williton, Somerset, 1 y., 3 m.:—and J. WHITE, 1 y., 3 m.

**CLASS 78.**—*Pair of Devon Long-Wool Ram Lambs, dropped in 1893.*  
[5 entries.]

**I. (£10.)**—N. COOK, Chevithorne, Tiverton, 4 m., 1 w.

**II. (£5.)**—N. COOK, 4 m.

**R.**—N. COOK, 4 m.

**CLASS 79.**—*Pen of Three Devon Long-Wool Shearling Ewes.*  
[6 entries.]

**I. (£10), and R. for Champion.\***—N. COOK, Chevithorne, Tiverton, 1 y., 3 m., 3 w.

**II. (£5.)**—N. COOK, 1 y., 3 m., 3 w.

**III. (£2.)**—Sir J. H. H. AMORY, Bart., Knightshayes Court, Tiverton, 1 y., 2 m., 3 w.

**R.**—Sir J. H. H. AMORY, Bart., 1 y., 3 m.

### OTHER LONG-WOOL BREEDS.

**CLASS 80.**—*Shearling Ram.*

[No ENTRY.]

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\* Given by the Gloucester Local Committee for the best Long-woolled Ewe in any of the Classes.

*Prizes awarded to Southdown and Hampshire Down Sheep.* xxix

**CLASS 81.—Pair of Ram Lambs, dropped in 1893.**

[No ENTRY.]

**CLASS 82.—Pen of Three Shearling Ewes.**

[No ENTRY.]

**SOUTHDOWN.**

**CLASS 83.—Southdown Shearling Ram.** [18 entries.]

**I. (£10), and R.** for Champion.\*—J. S. HODGSON, Lythe Hill, Haslemere, Surrey, 1 y., 3 m., 3 w.

**II. (£5).**—J. BLYTH, Wood House, Stansted, Essex, 1 y., 3½ m.

**III. (£2).**—H.R.H. THE PRINCE OF WALES, K.G., Sandringham, Norfolk, 1 y., 3 m.

**R. & H. C.**—Sir W. THROCKMORTON, Bart., Buckland, Faringdon, Berks, 1 y., 3 m., 1 w., 4 d.

**H. C.**—E. ELLIS, Summersbury, Shalford, Guildford, 1 y., 3 m.

**C.**—H. L. C. BRASSEY, Preston Hall, Aylesford, Kent, 1 y., 3 m.

**CLASS 84.—Pair of Southdown Ram Lambs, dropped in 1893.**

[11 entries.]

**I. (£10).**—E. ELLIS, Summersbury, Shalford, Guildford, 3 m., 2 w.

**II. (£5).**—DUKE OF NORTHUMBERLAND, K.G., Albury Park, Guildford, 15 w., 1 d.; 14 w., 2 d.

**III. (£2).**—J. BLYTH, Wood House, Stansted, Essex, 3½ m.

**R. & H. C.**—J. S. HODGSON, Lythe Hill Farm, Haslemere, Surrey, 3 m., 3 w.

**CLASS 85.—Pen of Three Southdown Shearling Ewes.** [12 entries.]

**I. (£10).**—J. BLYTH, Wood House, Stansted, Essex, 1 y., 3½ m.

**II. (£5).**—H. L. C. BRASSEY, Preston Hall, Aylesford, Kent, 1 y., 3 m.

**III. (£2).**—E. ELLIS, Summersbury, Shalford, Guildford, 1 y., 3 m.

**R. & H. C.**—J. S. HODGSON, Lythe Hill Farm, Haslemere, Surrey, 1 y., 3 m., 3 w.

**HAMPSHIRE DOWN.**

**CLASS 86.—Hampshire Down Shearling Ram.** [6 entries.]

**I. (£10).**—W. NEWTON, Crowmarsh Battle, Wallingford, 1 y., 4 m., 2 w.

**II. (£5).**—H. LE ROY LEWIS, Westbury Park, Petersfield, Hants, **Cabul**, 1 y., 4 m., 1 w.

**III. (£2).**—F. R. MOORE, Littlecott, Upavon, Wilts, 1 y., 4 m., 2 w.

**R.**—H. LE ROY LEWIS, **Caddy**, 1 y., 4 m., 1 w.

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\* Given by the Gloucester Local Committee for the best Short-woolled Ram or Ram Lamb in any of the Classes.

xxx *Prizes awarded to Hampshire Down and Shropshire Sheep.*

CLASS 87.—*Pair of Hampshire Down Ram Lambs, dropped in 1893.*  
[9 entries.]

- I. (£10).—W. NEWTON, Crowmarsh Battle, Wallingford, 4 m., 2 w.  
II. (£5).—F. R. MOORE, Littlecott, Upavon, Wilts, 4 m., 3 w.  
III. (£2).—J. BARTON, Hackwood Farm, Basingstoke, 4 m., 1 w.  
R.—H. LE ROY LEWIS, Westbury Park, Petersfield, Hants, 4 m., 2 w.

CLASS 88.—*Pen of Three Hampshire Down Shearling Ewes.*  
[6 entries.]

- I. (£10), and Champion (£10.\*)—W. NEWTON, Crowmarsh Battle, Wallingford, 1 y., 4 m., 2 w.  
II. (£5).—F. R. MOORE, Littlecott, Upavon, Wilts, 1 y., 4 m., 2 w.  
III. (£2).—H. LE ROY LEWIS, Westbury Park, Petersfield, Hants, 1 y., 4 m., 1 w.  
R.—H. J. S. TOBY, Sturminster Marshall, Wimborne, Dorset, 1 y., 4 m., 1 w.

SHROPSHIRE.

CLASS 89.†—*Shropshire Shearling Ram.* [52 entries.]

- I. (£10).—J. BOWEN-JONES, Ensdon House, Montford Bridge, 1 y., 3 m. about.  
II. (£5).—R. P. COOPER, Shenstone Court, Lichfield, 1 y.  
III. (£3).—Representatives of the late G. GRAHAM, The Oaklands, near Birmingham, 1 y., 3 m. about, bred by the late G. Graham.  
IV. (£2).—W. KIRKHAM, Bangley Farm, Tamworth, 1 y., 2 m., 1 w.  
R. & H. C.—Mrs. M. BARRS, Odstone Hall, Atherstone, 1 y., 3 m. about.  
H. C.—T. and S. BRADBURN, Astwood Hill, Redditch :—Representatives of the late G. GRAHAM, 1 y., 3 m. about, bred by the late G. Graham :—and A. E. MANSELL, Harrington Hall, Shifnal, 1 y., 3 m.  
C.—J. BOWEN-JONES, 1 y., 3 m. about :—T. FENN, Stonebrook House, Ludlow, 1 y., 2 m., 2 w. :—J. HARDING, Norton House, Shifnal, Salop, 1 y., 3 m. about :—W. F. INGE, Thorpe Hall, Tamworth, 1 y., 3 m. about :—and for his 1 y., 3 m. about :—G. LEWIS, Ercall Park, Wellington, Salop, 1 y., 3 m., 6 d. :—A. E. MANSELL, 1 y., 3 m. :—T. MEARES, Clive Hall, Grinshill, Salop, 1 y., 3 m., 1 w. :—E. NOCK, Brockton House, Shifnal, Salop, 1 y., 3 m. :—and H. C. G. PARKER, Park Farm, Alcester, Lord Chester, 1 y., 3 m.

CLASS 90.—*Pair of Shropshire Ram Lambs, dropped in 1893.*  
[20 entries.]

- I. (£10).—A. E. MANSELL, Harrington Hall, Shifnal, 3 m., 2 w.  
II. (£5).—H. C. G. PARKER, Park Farm, Alcester, 3 m., 2 w.

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\* Given by the Gloucester Local Committee for the best Short-woolled Ewe in any of the Classes.

† The third and fourth Prizes in Classes 89 and 91 were given by the Shropshire Sheep Breeders' Association.

**III. (£2).**—A. BRADBURN, Hammerwich Place, near Lichfield, 3 m., 3 d.

**R. & H. C.**—T. and S. BRADBURN, Astwood Hill, Redditch.

**C.**—H. BRADBURN, Pipe Place, Lichfield, 3 m., 1 w. about:—and J. PULLEY, Lower Eaton, Hereford, 3 m., 1 w.

**CLASS 91.\*—Pen of Three Shropshire Shearling Ewes.** [20 entries.]

**I. (£10)** and **R.** for Champion.†—T. FENN, Stonebrook House, Ludlow, y., 2 m., 2 w. about.

**II. (£5).**—The Representatives of the late G. GRAHAM, The Oaklands, Birmingham, 1 y., 3 m. about; bred by the late G. Graham.

**III. (£3).**—Mrs. M. BARRS, Odstone Hall, Atherstone, 1 y., 3 m. about.

**IV. (£2).**—J. BOWEN-JONES, Ensdon House, Montford Bridge, Salop, Shropshire, 1 y., 3 m. about.

**R. & H. C.**—T. and S. BRADBURN, Astwood Hill, Redditch.

**H. C.**—R. P. COOPER, Shenstone Court, Lichfield, 1 y.:—W. F. INGE, Morpe Hall, Tamworth, 1 y., 3 m. about:—and E. NOCK, Brockton House, Welford, Salop, 1 y., 3 m.

**C.**—J. PULLEY, Lower Eaton, Hereford, 1 y., 3 m., 3 d.:—and A. TANNER, Wrawardine, Shrewsbury, 1 y., 3 m.

## OXFORD DOWN.

**CLASS 92.—Oxford Down Shearling Ram.** [9 entries.]

**I. (£10)** and **Champion (£10).‡**—A. BRASSEY, Heythrop Park, Chipping Norton, **Heythrop Prince**, 1 y., 4 m., 2 w.

**II. (£5).**—A. BRASSEY, 1 y., 4 m., 2 w.

**III. (£2).**—G. ADAMS, Royal Prize Farm, Pidnell, Faringdon, Berks, Salisbury, 1 y., 4 m., 2 w.

**R. & H. C.**—G. ADAMS, Balfour, 1 y., 4 m., 2 w.

**CLASS 93.—Pair of Oxford Down Ram Lambs, dropped in 1893.**  
[6 entries.]

**I. (£10).**—A. BRASSEY, Heythrop Park, Chipping Norton, 4 m., 3 w.

**II. (£5).**—A. BRASSEY, 4 m., 2 w.

**III. (£2).**—G. ADAMS, Royal Prize Farm, Pidnell, Faringdon, Berks, m., 2 w., 5 d.

**R. & H. C.**—G. ADAMS, 4 m., 2 w., 2 d.

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\* The third and fourth Prizes in Classes 89 and 91 were given by the Shropshire Sheep Breeders' Association.

† Given by the Gloucester Local Committee for the best Short-woolled Ewe in any of the Classes.

‡ Given by the Gloucester Local Committee for the best Short-woolled Ram or Lamb in any of the Classes.

**CLASS 94.—*Pen of Three Oxford Down Shearling Ewes.***

[8 entries.]

- I. (£10.)**—A. BRASSEY, Heythrop Park, Chipping Norton, 1 y., 4 m.  
**II. (£5.)**—G. ADAMS, Royal Prize Farm, Pidnell, Faringdon, Berks, 1 y., 4 m., 2 w., 5 d.  
**III. (£2.)**—G. ADAMS, 1 y., 4 m., 2 w., 6 d.  
**R. & H. C.**—J. BRYAN, Southleigh, Witney, Oxon, 1 y., 3 m., 2 w., 2 d.  
**C.**—J. BRYAN, 1 y., 3 m., 2 w., 2 d. about.

**SOMERSET AND DORSET HORN.****CLASS 95.—*Somerset and Dorset Horn Shearling Ram.*** [3 entries.]

- I. (£10.)**—S. KIDNER, Bickley, Milverton, Somerset, **Bickley Frooms No. 1**, 1 y., 5 m., 2 w.  
**II. (£5.)**—CULVERWELL BROTHERS, Durleigh Farm, Bridgwater, 1 y., 5 m., 6 d.  
**R. & H. C.**—CULVERWELL BROS., 1 y., 5 m., 6 d.

**CLASS 96.—*Pair of Somerset and Dorset Horn Ram Lambs, dropped after Dec. 1st, 1892.*** [3 entries.]

- I. (£10.)**—S. KIDNER, Bickley, Milverton, Somerset, 5 m., 2 w.  
**II. (£5.)**—CULVERWELL BROS., Durleigh Farm, Bridgwater, 5 m., 2 w., 2 d.  
**R. & H. C.**—CULVERWELL BROS., 5 m., 2 w., 2 d.

**CLASS 97.—*Pen of Three Somerset and Dorset Horn Shearling Ewes.*** [3 entries.]

- I. (£10.)**—CULVERWELL BROS., Durleigh Farm, Bridgwater, 1 y., 5 m., 6 d.  
**II. (£5.)**—CULVERWELL BROS., 1 y., 5 m., 6 d.  
**R. & H. C.**—S. KIDNER, Bickley, Milverton, Somerset, 1 y., 5 m., 2 w.

**MOUNTAIN.****CLASS 98.—*Mountain Two-Shear or Shearling Ram.*** [2 entries.]

- I. (£10.)**—Sir W. WILLIAMS, Bart., Heanton, Barnstaple, 2 y., 2 m.  
**R. & H. C.**—Sir W. WILLIAMS, Bart., 1 y., 2 m.

**CLASS 99.—*Pen of Three Mountain Shearling Ewes.*** [4 entries.]

- I. (£10.)**—Sir W. WILLIAMS, Bart., Heanton, Barnstaple, 1 y., 2 m.  
**II. (£5.)**—Sir W. WILLIAMS, Bart., 1 y., 2 m.  
**R. & H. C.**—E. J. STANLEY, M.P., Quantock Lodge, Bridgwater, 1 y., 2 m., 3 w., 3 d.

**OTHER SHORT-WOOL BREEDS.**

**CLASS 100.—*Shearling Ram.***

[No ENTRY.]

**CLASS 101.—*Pen of Three Shearling Ewes.* [2 entries.]**

**II. (£5.)**—J. H. LARGE, Crudwell, Malmesbury, *Oxford-Hampshire*, 1 y., 3 m., 1 w., 3 d.

**R.**—J. H. LARGE, 1 y., 3 m., 1 w., 3 d.

**PIGS.**

**BERKSHIRE.**

**CLASS 102.—*Berkshire Boar, farrowed in 1890 or 1891.* [5 entries.]**

**I. (£7.)**—Rev. W. FAWCETT, Somerford Keynes, Cricklade, **Fitzcurzon** (B.B. 3730), 2 y., 4 m., 4 w., 1 d., bred by R. Swanwick, Cirencester; s., Lord Curzon (B.B., 2012); d., Sallie (ccccxxvi., B.B., 2176); s. of d., Phœbus (B.B., 1055).

**II. (£3.)**—Sir H. F. de TRAFFORD, Bart., the Flordon Stud Farm, Norfolk, **Barton King** (3509), 2 y., 4 m., 2 w., 3 d.; s., Barton Royal (3499); d., Barton Regina (3568); s. of d., Premier.

**R. & H. C.**—J. P. KING, North Stoke, Wallingford, 2 y., 2 m.; s., Athelhampton (2574); d., Ruby 30th (736); s. of d., Samphire (69).

**H. C.**—S. SMITH, Woodmanton, Hereford, **Bingley**, 1 y., 10 m., 2 w., 1 d.; bred by C. A. Barnes, Rickmansworth, Herts; s., Potatoes (2880); d., Duchess 11th (2879); s. of d. Admiral (1425).

**C.**—R. SWANWICK, R. A. College Farm, Cirencester, **Choice Curzon** (B.B.R., 3669), 1 y., 8 m., 2 w., 4 d.; s., Lord Curzon (B.B.R., 2012); d., 1st Choice 4 (B.B.R., 2738); s. of d., Prince Imperial (B.B.R., 2171).

**CLASS 103.—*Berkshire Boar, farrowed in 1892.* [10 entries.]**

**I. (£7) and Champion\* (£10.)**—W. PINNOCK, Littleworth House, Wantage, 1 y., 2 m., 1 w.; s., Windsor Supreme; d., Wantage Poetess (B.); s. of d., Longstop.

**II. (£3.)**—W. PINNOCK, 1 y., 2 m., 1 w.; s., Windsor Supreme; d., Wantage Poetess (B); s. of d., Longstop.

**III. (£2.)**—A. E. W. DABBY, Little Ness, Shrewsbury, **Philo**, 1 y., 4 m., 10 d.; s., Big Ben (2204); d., Persephone; s. of d., Mayhill (2626).

**R. & H. C.**—LORD WANTAGE, V.C., K.C.B., Pytchley Lodge, Kettering, **Enoch**, 1 y., 3 m., 2 w., 4 d.; s., Sir Pinnock; d., Miss Addie 2nd (B.B., 2544); s. of d., Sir Walter (B.B., 1182).

**H. C.**—E. BURBIDGE, South Wraxall, Bradford-on-Avon, 8 m., 3 w.; s., Simplex; d., Sarah Jane; s. of d., First Class (2239).

\* Given by the Gloucester Local Committee for the best Boar in any of the Classes.



**C.**—R. SWANWICK, R. A. College Farm, Cirencester, **Sambo** (215) 1 y., 3 m., 1 w., 1 d.; s., Lord Curzon (B.B.R., 2012); d., Nathalie 23 (B.B.R., 3307); s. of d., Phœbus (B.B.R., 1055):—and for his **Expectation** 4th, 9 m., 3 w., 6 d.; s., Expectation 3rd (B.B.R., 3309); d., Sallie 436 (B.B.R., 3663); s. of d., Lord Curzon (B.B.R., 2012).

**CLASS 104.—Pair of Berkshire Breeding Boars, farrowed in 1893.**  
[10 entries.]

**I. (£5).**—E. BURBIDGE, South Wraxall, Bradford-on-Avon, 3 m., 3 w., 2 d. s., Simplex; d., Waiting Maid; s. of d., First Class (B.B., 2239).

**II. (£2).**—A. E. W. DARBY, Little Ness, Shrewsbury, 4 m., 2 w., 3 d.; s., Big Ben (2204); d., Passover (3817); s. of d., Attempt (2789).

**III. (£1).**—R. SWANWICK, R. A. College Farm, Cirencester, 4 m., 1 w., 3 d.; s., Ray; d., Sallie 586 (B.B.R., 3664); s. of d., Curzon (B.B.R., 2012).

**R. & H. C.**—W. PINNOCK, Littleworth House, Wantage, 2 m., 2 w. s., Lord Curzon; d., Wantage Poetess B.; s. of d., Longstop.

**CLASS 105.—Berkshire Breeding Sow, farrowed before 1893.**  
[23 entries.]

**I. (£7).**—R. SWANWICK, R. A. College Farm, Cirencester, **Sallie 666**, 1 y., 3 m., 1 w., 1 d.; s., Prince Imperial (B.B.R., 2171); d., Sallie 246 (B.B.R., 2176); s. of d., Phœbus (B.B.R., 1055).

**II. (£3).**—W. PINNOCK, Wantage, 1 y., 2 m., 1 w.; s., Windsor's Supreme d., Wantage Poetess B.; s. of d., Longstop.

**III. (£2).**—R. SWANWICK, 1st Choice 10 (B.B.R., 8671), 1 y., 8 m., 2 w., 4 d.; s., Lord Curzon (B.B.R., 2012); d., 1st Choice 4 (B.B.R., 2756) s. of d., Prince Imperial (B.B.R., 2171).

**IV. (£1.)\***—R. SWANWICK, **Sallie 676**, 1 y., 3 m., 1 w., 1 d.; s., Prince Imperial (B.B.R., 2171); d., Sallie 246 (B.B.R., 2176); s. of d., Phœbus (B.B.R., 1055).

**R. & H. C.**—Col. J. B. JENKINS, Kingston, Abingdon, **Amy Robsart**, 1 y., 4 m., 2 w., 6 d.; s., Longstop; d., Kingston Wick; s. of d., Tim of Taynton.

**H. C.**—J. BLYTH, Wood House, Stansted, Essex, 11 m., 3 w., 1 d.; s., Barton Ben; d., Barton Queen; s. of d., Premier:—J. P. KING, North Stoke, Wallingford, 1 y., 4 m., 1 w., 4 d.; s., Lord Curzon 3rd (3281); d., Moulshford 50th (3542); s. of d., Athelhampton (2574):—and Sir H. F. de TRAF-FORD, Bart, The Flordon Stud Farm, Norfolk, **Flordon Queen**, 1 y., 4 m., 3 w., 3 d.; s., Barton Royal (3499); d., Barton Queen (3503); s. of d., Premier (3463).

**C.**—LORD WANTAGE, V.C., K.C.B., Pytchley Lodge, Kettering, **Valentine**, 1 y., 3 m., 2 w., 4 d.; s., Sir Pinnock; d., Miss Addie 2nd (B.B., 2544); s. of d., Sir Walter (B.B., 1182):—and for his **Kitty** 4th, 1 y., 4 m., 3 w., 6 d.; s., Safety (B.B., 2534); d., Kitty 2nd (B.B., 2539); s. of d., Ormonde (B.B., 1246):—A. E. W. DARBY, Little Ness, Shrewsbury, **Pavetta**, 1 y., 4 m., 3 w., 4 d.; s., Big Ben (2204); d., Passover (3817); s. of d., Attempt (2789):—J. A. FRICKER, Burton, Mere, Wilts, 1 y., 1 m., 3 w., 1 d.; s.,

\* Specially recommended.

*Prizes awarded to Pigs (Large White Breed).*      xxxv

Florida; d., Bernice's Duchess:—A. FROGLEY, Sparsholt, Wantage, Berks, **Baroness Sparsholt**, 1 y., 7 m., 3 w.; s., Baron, Sparsholt; d., Black **Claud**; s. of d., Random:—G. GREENALL, Walton Hall, Warrington, **Walton Lady Colin**, 1 y., 4 m., 2 w., 4 d., bred by N. Benjafield, Motcombe; s., Prime Minister (3295); d., Lady Colin (1258):—and for his **Walton Royal** 1st, 1 y., 4 m., 2 w., 6 d., bred by R. Swanwick, Cirencester; s., Castle Royal (3590); d., Sallie (586):—J. W. KIMBER, Fyfield Wick, Abingdon, **Magnific**, 1 y., 4 m., 6 d.; s., Longstop; d., **Magnetic**; s. of d., Tim of Laynton:—J. LAWRENCE, Stall Pits Farm, Shrivenham, 1 y., 4 m., 4 w., 2 d., s., Roy Augustus; d., Clamour (224); s. of d., Ruck's Pride (1585):—W. PINNOCK, s., Longstop; d., Taynton Poetess; s. of d., Lad of the Manor:—R. SWANWICK, **1st Choice 12** (B.B.R., 3683), 1 y., 3 m., 1 w., 5 d.; s., Lord Curzon (B.B.R., 2012); d., First Choice 8 (B.B.R., 3683); s. of d., Realization (B.B.R., 2751):—and G. WOOD-HOMER, Ilington Lodge, Dorchester, **Princess 12th**, 3 y., 4 m., 3 w., 6 d.; s., Abbot 3rd (B.B., vol. vii., 3163); d., Princess 5th (B.B.H.B., 1284); s. of d., Warwick 2nd (B.B., vol. iii., 245).

*CLASS 106.—Pair of Berkshire Breeding Sows, farrowed in 1893.*

[14 entries.]

**I. (£5).**—Sir H. F. de TRAFFORD, Bart., The Flordon Stud Farm, Norfolk, s. m.; s., Tavistock (3750); d., Barton Queen (3503); s. of d., Premier (3463).

**II. (£2).**—Col. J. B. JENKINS, Kingston, Abingdon, 4 m., 3 w., 3 d.; s., Windsor's Supreme; d., Cleopatra 2nd; s. of d., Lad of the Manor.

**III. (£1).**—W. PINNOCK, Wantage, 2 m., 2 w.; s., Lord Curzon; d., Wantage Poetess B.; s. of d., Longstop.

**R. & H. C.**—LORD WANTAGE, V.C., K.C.B., Pytchley Lodge, Kettering, 4 m., 1 w., 2 d.; s., Safety (B.B., 2534); d., Kitty 2nd (B.B., 2539); s. of d., Ormonde (B.B., 1246).

**H. C.**—G. WOOD-HOMER, Ilington Lodge, Dorchester, 5 m., 1 d.; s., Abbot 3rd (B.B., vol. vii., 3163); d., Princess 18th; s. of d., Cranborne (B.B., 2334).

**LARGE WHITE BREED.**

*CLASS 107.—Large White Boar, farrowed in 1890 or 1891.*

[5 entries.]

**I. (£7).**—D. R. DAYBELL, Bottesford, Nottingham, **Bottesford Rover**, 4 y., 10 m., 1 w., 3 d.; s., Cestram Rover; d., Bottesford Lass 6th; s. of d., King Henry 2nd (1355).

**II. (£3).**—J. NUTTALL, Longfield, Heywood, Lancashire, 2 y., 4 m., 2 w., 1 d.; s., Ben 3rd (927).

**R. & H. C.**—D. GIBSON, Metchley, Edgbaston, Birmingham, **Borrowfield Rufford** (1711), 3 y., 3 m., 2 w., 3 d., bred by P. Ascroft, Rufford, Ormskirk; s., Ben 3rd (927); d., Elenora (688); s. of d., Ben (59).

**C.**—F. ALLMAND, Victoria Mill, Wrexham, **Wrexham Joe**, 1 y., 7 m., 1 w., 1 d., bred by S. Spencer, St. Ives, Hunts; s., Holywell Plymouth (1829); d., Holywell Princess 2nd (vol. ix.); s. of d., Holywell Q.C. (1011).

**CLASS 108.—Large White Boar, farrowed in 1892. [3 entries.]**

**I. (£7).—S. SPENCER**, Holywell Manor, St. Ives, **Holywell Gloucester**, 1 y., 3 m.; s., Holywell Cripple; d. Holywell Sprat; s. of d., Holywell Jackie.

**II. (£3).—D. GIBSON**, Metchley, Edgbaston, Birmingham, **Metchley Baron**, 1 y., 1 m., 2 w.; s., Metchley King (2321); d., Metchley Queen Bee (3312); s. of d., Duke (1263).

**R.—D. GIBSON**, **Metchley Count**, 1 y., 1 m., 2 w.

**CLASS 109.—Pair of Large White Breeding Boars, farrowed in 1893. [4 entries.]**

**I. (£5).—D. GIBSON**, Metchley, Edgbaston, Birmingham, 4 m., 4 w.; s., Duke (1263); d., Metchley Queen (3310); s. of d., Lord Derry (531).

**II. (£2).—S. SPENCER**, Holywell Manor, St. Ives, 4 m., 2 w.; s., Holywell Plymouth; d., Holywell Waxwork; s. of d., Holywell King.

**R. & H. C.—D. GIBSON**, 4 m., 3 w., 5 d.; s., Metchley King (2321); d., Metchley Judy (3298); s. of d., Duke (1263).

**C.—F. ALLMAND**, Victoria Mill, Wrexham, 4 m., 3 d.; s., Wrexham Joe; d., Wrexham Kitty; s. of d., Holywell Ben (1801).

**CLASS 110.—Large White Breeding Sow, farrowed before 1893. [7 entries.]**

**I. (£7), and Champion (£10).\***—D. R. DAYBELL, Bottesford, Nottingham, **Bottesford Lass XI.**, 2 y., 5 m.; s., Cestram Rover; d., Bottesford Lass 6th; s. of d., King Henry 2nd (1355).

**II. (£3).—D. GIBSON**, Metchley, Edgbaston, Birmingham, **Jessica** (2374), 4 y., 8 m., 1 d.; s., Birmingham (673); d., Joan (2378); s. of d., Cardiff (1245).

**III. (£2).—S. SPENCER**, Holywell Manor, St. Ives, **Holywell Giantess 10th**, 2 y., 2 m., 3 w., 3 d.; s., Holywell Plymouth; d., Holywell Giantess 2nd; s. of d., Holywell Nick.

**R. & H. C.—J. NUTTALL**, Longfield, Heywood, Lancashire, 3 y., 8 m., 2 w., bred by Prescott Union, Lancashire; s., Ben 3rd; d., Princess.

**C.—S. SPENCER**, **Holywell Boneless**, 2 y., 5 m., 3 w., 5 d.; s., Holywell Joseph; d., Holywell Bonny; s. of d., Holywell Judge.

**CLASS 111.—Pair of Large White Breeding Sows, farrowed in 1893. [5 entries.]**

**I. (£5).—J. NUTTALL**, Longfield, Heywood, Lancashire, 4 m., 4 w.; s., Samson; d., Sall.

**II. (£2).—D. GIBSON**, Metchley, Edgbaston, Birmingham, 4 m., 4 w.; s., Duke (1263); d., Metchley Queen Bee (3310); s. of d., Lord Derry (531).

**R.—S. SPENCER**, Holywell Manor, St. Ives, Hunts, 4 m., 1 w.; s., Holywell Squire 2nd; d., Holywell Queen 30th; s. of d., Holywell Q.C.

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\* Given by the Gloucester Local Committee for the best Sow in any of the Classes.

**MIDDLE WHITE BREED.**

**CLASS 112.—*Middle White Boar, farrowed in 1890 or 1891.***  
[4 entries.]

**I. (£7.)**—S. SPENCER, Holywell Manor, St. Ives, Hunts, **Holywell Count**, 2 y., 11 m., 1 w., 3 d.; s., German Baron, d.; Holywell Choice; s. of d., Holywell Swell.

**II. (£3.)**—J. NUTTALL, Longfield, Heywood, Lancashire, 2 y., 4 m., 3 w., 2 d.; s., Hero; d., Lucy.

**R. & H. C.**—A. C. TWENTYMAN, Castlecroft, Wolverhampton, **Consul**, 2 y., 4 m., 3 w., 5 d.; s., Young Juan (1551); d., Rosy (2718); s. of d., Silver King (603).

**CLASS 113.—*Middle White Boar, farrowed in 1892.*** [5 entries.]

**I. (£7.)**—A. C. TWENTYMAN, Castlecroft, Wolverhampton, **Castlecroft Deacon**, 1 y., 4 m., 3 w., 6 d.; s., Young Juan (1551); d., Rosy (2718); s. of d., Silver King (603).

**II. (£3.)**—S. SPENCER, Holywell Manor, St. Ives, **Holywell Billy**, 1 y., 4 m., 2 w., 5 d.; s., Holywell Curly Boy; d., Holywell Beauty 2nd; s. of d., Holywell Swell.

**R. & H. C.**—S. SPENCER, **Holywell Curly Lad**, 1 y., 4 m., 2 w., 5 d.; s., Holywell Slasher; d., Holywell Curly Girl; s. of d., Holywell Silky 4th.

**CLASS 114.—*Pair of Middle White Breeding Boars, farrowed in 1893***  
[6 entries.]

**I. (£5.)**—A. C. TWENTYMAN, Castlecroft, Wolverhampton, 4 m., 3 w., 4 d.; s., Bruce (2451); s. of d., Young Juan (1551).

**II. (£2.)**—S. SPENCER, Holywell Manor, St. Ives, 4 m., 3 w., 5 d.; s., Holywell St. Simon; d., Holywell Swansy; s. of d., Holywell Count.

**R. & H. C.**—S. SPENCER, 4 m., 3 w., 5 d.; s., Holywell St. Simon; d., Holywell Swansy; s. of d., Holywell Count.

**H. C.**—D. GIBSON, Metchley, Edgbaston, Birmingham, 4 m., 3 w., 5 d.; s., Prince of Worsley 4th (1533); d., Metchley Moselle (4190); s. of d., Sailor 3rd (1541).

**CLASS 115.—*Middle White Breeding Sow, farrowed before 1893.***  
[8 entries.]

**I. (£7.)**—J. NUTTALL, Longfield, Heywood, Lancashire, 1 y., 10 m., 11 d.; s., Hero; d., Lucy.

**II. (£3.)**—S. SPENCER, Holywell Manor, St. Ives, **Holywell Spottie**, 2 y., 8 m., 4 w.; s., Holywell Silky 4th; d., Holywell Bess; s. of d., Holywell Ponfield.

**III. (£2.)**—S. SPENCER, **Holywell Rose**, 5 y., 2 m., 3 w., 3 d.; s., Holywell Swell; d., Holywell Duchess; s. of d., No. 1.

**R. & H. C.**—D. GIBSON, Metchley, Edgbaston, Birmingham, **Metchley Moselle** (4190), 2 y., 6 m., 1 w., 3 d., bred by F. Walker-Jones, Chester; s., Sailor 3rd (1541); d., Elfrida 3rd (2662); s. of d., Punchinello (391).

xxxviii *Prizes awarded to Pigs (Small White or Small Black)*

**H. C.**—A. C. TWENTYMAN, Castlecroft, Wolverhampton, 1 y., 11 m., 1 w., 6 d.; s., Young Juan (1551); d., Rosy (2718); s. of d., Silver King (603).

**C.**—LORD TREDEGAR, Tredegar Park, Newport, Monmouth, 9 m., 4 w.; s., Lord Tortworth; d., Tredegar Lass; s. of d., Britannia Wonder (301):—and his 9 m., 4 w.; s., Lord Tortworth; d., Tredegar Lass; s. of d., Britannia Wonder (301).

**CLASS 116.—Pair of Middle White Breeding Sows,  
farrowed in 1893. [4 entries.]**

**I. (£5.)**—S. SPENCER, Holywell Manor, St. Ives, 4 m., 3 w., 5 d.; s., Holywell St. Simon; d., Holywell Swan; s. of d., Holywell Count.

**II. (£2.)**—S. SPENCER, 4 m., 3 w., 5 d.; s., Holywell St. Simon; d., Holywell Swan; s. of d., Holywell Count.

**R. & H. C.**—J. NUTTALL, Longfield, Heywood, Lancashire, 4 m., 2 w., 5 d.; s., Rector (1537); d., Lucy; s. of d., Prince of Worsley (1529).

**SMALL WHITE OR SMALL BLACK BREED.**

**CLASS 117.—Small White or Small Black Boar, farrowed in 1890  
or 1891. [4 entries.]**

**I. (£7.)**—Hon. D. P. BOUVERIE, Coleshill House, Highworth, white, **Swansea**, 1 y., 9 m., 2 w., 4 d.; s., King William (2097); d., Coleshill Kitty; s. of d., Prince (1135).

**II. (£3.)**—Hon. D. P. BOUVERIE, white, **Warwick**, 1 y., 11 m., 1 w., 1 d.; s., King William (2097); d., Katherine 3rd; s. of d., Prince (1135).

**R.**—Hon. D. P. BOUVERIE, white, **Bath** (2473), 3 y., 3 w., 1 d.; s., Earl Chester (1553); d., Spot 9th (3680).

**CLASS 118.—Small White or Small Black Boar, farrowed in 1892.  
[4 entries.]**

**I. (£7.)**—Hon. D. P. BOUVERIE, Coleshill House, Highworth, Wilts; white, **Coleshill Shamrock**, 1 y., 4 m., 2 w.; s., Coleshill Farmer (2093); d., Shaftesbury (3678); s. of d., Prince (1135).

**II. (£3.)**—Hon. D. P. BOUVERIE, white, 10 m., 2 w., 1 d.; s., Royal Doncaster (2477); d., Katherine 3rd; s. of d., Prince.

**R. & H. C.**—D. GIBSON, Metchley, Edgbaston, Birmingham, white, 11 m., bred by Prescot Guardians, Prescot; d., Whiston Toy 2nd; s. of d., Prescot Toy (2099).

**CLASS 119.—Pair of Small White or Small Black Breeding Boars,  
farrowed in 1893. [2 entries.]**

**I. (£5.)**—Hon. D. P. BOUVERIE, Coleshill House, Highworth, Wilts, white, 4 m., 3 w., 3 d.; s., Prescot; d., Shaftesbury (3678); s. of d., Prince (1135).

**R. & H. C.**—Hon. D. P. BOUVERIE, white, 4 m., 3 w., 4 d.; s., Prescot; d., Princess Pearl (3676); s. of d., Prince Pearl (1137).

**CLASS 120.—*Small White or Small Black Breeding Sow, farrowed before 1893.* [5 entries.]**

**I. (£7.)**—D. GIBSON, Metchley, Edgbaston, Birmingham, white, **Whiston Toy 2nd**, 2 y., 4 m., 4 w., 1 d., bred by Prescott Guardians, Prescott; s., Prescott Toy (2099); d., Whiston Toy (3686); s. of d., Roger 2nd (875).

**II. (£3.)**—Hon. D. P. BOUVERIE, Coleshill House, Highworth, Wilts, white, **Coleshill Margery**, 1 y., 7 m., 4 w., 1 d.; s., Coleshill Farmer (2093); d., Lady Rodney (2674); s. of d., Rodney (873).

**R. & H. C.**—Hon. D. P. BOUVERIE, white, **Coleshill Dot**, 1 y., 7 m., 4 w., 1 d.; s., Coleshill Farmer (2093); d., Lady Rodney (2674); s. of d., Rodney (873).

**C.**—LORD TREDEGAR, Tredegar Park, Newport, Monmouth, white, 10 m., 4 d.; s., Lord Tortworth; d., Lady Radnor Bouverie; s. of d., Prince:—and his white, 10 m., 4 d., ditto.

**CLASS 121.—*Pair of Small White or Small Black Breeding Sows, farrowed in 1893.* [2 entries.]**

**I. (£5.)**—Hon. D. P. BOUVERIE, Coleshill House, Highworth, Wilts, white, 4 m., 3 w., 3 d.; s., Prescott; d., Shaftesbury (3678); s. of d., Prince (1135).

**R. & H. C.**—Hon. D. P. BOUVERIE, white, 4 m., 3 w., 4 d.; s., Prescott; d., Princess Pearl (3676); s. of d., Prince Pearl (1137).

**ANY OTHER BREED.**

**CLASS 122.—*Boar, farrowed in 1890 or 1891.* [4 entries.]**

**I. (£7.)**—EARL OF DERBY, Birtley, Witley, Surrey, a Tamworth, **Colebrook Squire**, 2 y., 11 m., 1 w., 1 d., bred by R. Boddington, Shirley, Birmingham; s., Earl Winterton (1583); d., Whitacre Princess (2936).

**II. (£3.)**—R. IBBOTSON, Knowle, Warwickshire, a Tamworth, **Lord Salisbury**, 1 y., 11 m., 2 w., bred by A. Ibbotson, Arley; s., Goldfinch; d., Gun Hill Confidence; s. of d., Gun Hill Prince.

**R. & H. C.**—JOHN and JOSEPH NORMAN, Cliff House, Tamworth, a Tamworth, **Harborough Hero**, 1 y., 5 m., 3 w., 2 d.; s., Plymouth Brother (2209); d., Nottingham Heroine (2048); s. of d., Newcastle Hero (889).

**CLASS 123.—*Boar, farrowed in 1892.* [4 entries.]**

**I. (£7.)**—D. W. PHILIP, The Ashes, Whitacre, Coleshill, a Tamworth, **Whitacre Goldfinder**, 11 m., 2 w.; s., Goldfinch (2505); d., Grand Duchess (3744); s. of d., Gun Hill Prince (1591).

**II. (£3.)**—R. IBBOTSON, Arley, Warwickshire, a Tamworth, **Duke of Westminster**, 11 m., 2 w., 5 d.; s., Lord Burleigh; d., Gun Hill Queen; s. of d., Gun Hill Reliance.

**CLASS 124.—*Pair of Breeding Boars, farrowed in 1893.* [4 entries.]**

**I. (£5.)**—R. IBBOTSON, Knowle, Warwickshire, 2 Tamworths, 5 m.; s., Lord Salisbury; d., Knowle Ruby (2024); s. of d., Samuel (427).

**II. (£2.)**—R. IBBOTSON, 2 Tamworths, 4 m., 2 w., 4 d.; s., Lord Salisbury; d., Knowle Rosalind; s. of d., Dorridge Champion.

**R.**—D. W. PHILIP, The Ashes, Whitacre, 2 Tamworths, 4 m., 4 w., bred by T. Watson, Whitacre Hall, Coleshill; s., Gun Hill Prince (1591); d., Whitacre Queen 6th; s. of d., Coleorton Duke (2127).

**CLASS 125.—*Breeding Sow, farrowed before 1893.* [5 entries.]**

**I. (£7.)**—R. IBBOTSON, Knowle, Warwickshire, a Tamworth, **Knowle Ruby**, 5 y., 11 m., 3 w., 2 d., bred by J. H. Peace, Knowle; s., Samuel (427); d., Peace's sow; s. of d., Sampson.

**II. (£3.)**—R. IBBOTSON, a Tamworth, **Knowle Favourite**, 2 y., 9 m., 2 w., 1 d.; s., Lord Warwick (2181); d., Rosa (2894); s. of d., Monarch.

**R. & H. C.**—JOHN and JOSEPH NORMAN, Cliff House, Tamworth, a Tamworth, **Cliffe Belle** (4242), 2 y., 3 m., 4 w., 1 d.; s., Plymouth Brother (2209); d., Red Queen (2062); s. of d., Redskin (421).

**H. C.**—EARL OF DERBY, Birtley, Witley, Surrey, a Tamworth, **Birtley Bess**, 1 y., 7 m., 2 w., 4 d.; s., Denham Boy 2nd; d., Lichfield Countess; s. of d., Tamworth Duke.

**CLASS 126.—*Pair of Breeding Sows, farrowed in 1893.* [4 entries.]**

**I. (£5.)**—R. IBBOTSON, Knowle, Warwickshire, 2 Tamworths, 4 m., 3 w., 3 d.; s., Lord Salisbury (2533); d., Knowle Favourite (4276); s. of d., Lord Warwick.

**II. (£2.)**—D. W. PHILIP, The Ashes, Whitacre, Coleshill, 2 Tamworths, 4 m., 4 w., 1 d.; s., Lord Burleigh (2527); d., Grand Duchess (3744); s. of d., Gun Hill Prince (1591).

**R. & H. C.**—J. SAUNDERS, Sutton, Cranborne, Dorset, crossbred, 4 m., 2 w., 1 d.; s., Berkshire Boar Coercion (2703); d., Middle White Sow.

## CHEESE.

**CLASS 127.—*Four Cheeses, made in 1892, not less than 56 lbs. each.* [21 entries.]**

**I. (£20.)**—BLACKMORE VALE DAIRY Co. (Limited), Lydlinch, Blandford.

**II. (£10.)**—BLACKMORE VALE DAIRY Co. (Limited).

**III. (£4.)**—T. C. CANDY, Woolcombe, Cattistock, Dorset.

**IV. (£1.)**—N. J. SIMS, Mitford, Shipston-on-Stour.

**R. & H. C.**—H. G. ASHMAN, Beacon Farm, Shepton Mallet.

**C.**—B. J. BUSH, Laverton, Bath :—J. MANFIELD, Hambridge, Curry Rivell, Taunton :—and N. J. SIMS.

**CLASS 128.—*Four Cheeses, made in 1893, not less than 30 lbs. each.* [25 entries.]**

**I. (£10.)**—N. J. SIMS, Mitford, Shipston-on-Stour.

**II. (£5.)**—W. C. SPENCER, Lower Wraxhall, Cattistock, Dorset.

**III. (£3.)**—H. CANNON, Milton Clevedon, Evercreech.

**IV. (£2.)**—H. FRANCIS, Malkin Hill Farm, Horsington, Bath.

**R. & H. C.**—BLACKMORE VALE DAIRY Co. (Limited), Lydlinch, Blandford.

**C.**—E. HISCOCK, Ashley Farm, Marnhull, Blandford.

**CLASS 129.\*—*Eight Single Gloucester Cheeses, made in 1893.***  
[3 entries.]

**I. (£5.)**—C. W. PROUT, Elm Court Farm, Coaley, Dursley.

**II. (£3.)**—W. HARRIS and SON, Court House Farm, Cam, Dursley.

**III. (£2.)**—G. PROUT, Standish Court, Stonehouse.]

**CLASS 130.—*Ten Loaf, or other Truckle Cheeses, made in 1893.***  
[9 entries.]

**I. (£4.)**—C. RYALL, North Cadbury, Bath.

**II. (£2.)**—W. C. SPENCER, Lower Wraxhall, Cattistock, Dorset.

**III. (£1.)**—BLACKMORE VALE DAIRY Co. (Limited), Lydlinch, Blandford.

**IV. (10s.)**—J. A. HARDING, Rodmead, Maiden Bradley, Bath.

**R. & H. C.**—E. CHAMPION, Brean Down, Bridgwater.

**C.**—E. T. GREEN, Steeple Ashton, Trowbridge.

**CLASS 131.—*Ten North Wilts Loaf Cheeses, made in 1893.***  
[2 entries.]

**I. (£4.)**—BLACKMORE VALE DAIRY Co. (Limited), Lydlinch, Blandford.

**CLASS 132.—*Five Cream or other Soft Cheeses.*** [6 entries.]

**I. (£2.)**—C. C. TUDWAY, Walcombe Dairy, Wells, Somerset.

**II. (£1.)**—A. ROUNTREE, Field House Dairy, Kirkby Overblow, Leeds.

**III. (10s.)**—A. ROUNTREE.

**CLASS 133.—*Four Caerphilly Cheeses, made in 1893.*** [9 entries.]

**I. (£4.)**—C. RYALL, North Cadbury, Bath.

**II. (£2.)**—C. RYALL.

**III. (£1.)**—C. C. GREEN, Pill Farm, Goldcliff, Newport, Monmouth.

**IV. (10s.)**—W. S. MARSH, Penybedd, Pembrey, Carmarthen.

**R. & H. C.**—A. T. EVANS, Widhill, Highworth, Wilts.

**C.**—W. HARRIS and SON, Court House Farm, Cam, Dursley.

**CLASS 134.—*Four Cheddar Cheeses (the total weight being not less than 200 lbs.) made in 1892 by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools.***  
[10 entries.]

**I. (£15.)**—Miss F. C. DAVIS, Farncombe Farm, Shepton Mallet.

**II. (£8.)**—Mrs. J. SHEPPY, Iwood House, Congresbury, near Bristol.

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\* Given by the Gloucester Local Committee, and open only to residents in the county of Gloucester.



III. (£6).—A. DARKNELL, South Cadbury, Bath.

IV. (£4).—Mrs. W. T. S. TILLEY, North Wootton, Shepton Mallet.

R. & H. C.—Miss B. HINKS, Manor Farm, Fifehead Magdalen, Gillingham, Dorset.

C.—Mrs. W. T. S. TILLEY.

CLASS 135.—*Four Cheddar Cheeses (not less than 30 lbs. each), made in 1893 by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools.* [10 entries.]

I. (£8).—Mrs. J. SHEPPY, Iwood House, Congresbury, near Bristol.

II. (£4).—Miss F. C. DAVIS, Farncombe Farm, Shepton Mallet.

III. (£3).—Mrs. E. COLLINS, Longhouse Farm, Oldford, Frome.

IV. (£2).—Mrs. J. SHEPPY.

R. & H. C.—Mrs. E. COLLINS.

C.—Mrs. W. T. S. TILLEY, North Wootton, Shepton Mallet:—and Miss C. H. TAYLOR, Laugford Court Farm, E. Somerset, R.S.O.

## BUTTER AND CREAM.

CLASS 136.—*3 lbs. of Fresh (or very slightly Salted) Butter, in pound plain rolls or brick shapes, made of Cream from Cows other than Channel Island Breeds.* [47 entries.]

I. (£5).—M. J. WILLIAMS, North Hill Farm, Chew Stoke.

II. (£3).—J. WILLIAMS, Regilbury Park, Winford.

III. (£2).—W. RIDDLE, Oldbury-on-Severn, Thornbury, R.S.O.

IV. (£1).—Mrs. J. S. ADAMS, Manor House Farm, Crick, near Chepstow.

R. & V. H. C.—C. PARBURY, Down House, Redmarley, near Newent, Gloucester.

V. H. C.—W. BODY, Leigh Hole Farm, Wrington, Somerset:—and H. SHEPHERD, Hailstones Farm, Wrington.

H. C.—Miss E. FOLLETT, Easton Royal, Pewsey, Wilts:—T. IMBER, Barton Hill, Shaftesbury:—J. RILEY, Putley Court, Ledbury:—G. ROBINSON, Sandfield, North Nibley, Dursley:—J. ROUND, Stanley Park Farm, Silsley, near Stroud:—J. B. SUTTON, East Farm, Winterbourne Gunner:—H. SWITHINBANK, Denham Court, Denham:—Mrs. J. WALKER, The Hill, Northleach:—and J. H. WALKER, Ockington, Dymock.

C.—T. ALLAN, Ryde Farm, Ripley, Surrey:—CATHEDRAL DAIRY Co., Exeter:—Mrs. L. CULLIMORE, Rockhampton, Gloucester:—Mrs. R. DOWDEWELL, Netherhill Farm, Frampton-on-Severn, Gloucester:—Mrs. E. EVANS, Eastern Hall, Ashbourne:—LONDON, GLOUCESTER AND NORTH HANTS DAIRY Co., Whatley Road, Clifton:—Mrs. A. PEARCE, Toddington, Cheltenham:—and Miss E. TRIGG, Adsett Farm, Westbury-on-Severn, Gloucester.

CLASS 137.—3 lbs. of Fresh (or very slightly Salted) Butter, in pound plain rolls or brick shapes, made of Cream from Cows of Channel Island Breeds only. [24 entries.]

I. (£4), and Champion\* (£5).—Mrs. J. WALKER, The Hill, Northleach.

II. (£2).—J. BLYTH, Wood House, Stansted, Essex.

III. (£1).—Mrs. M. CUSTANCE, Brook Heath, Breamore, Salisbury.

IV. (10s.).—CATHEDRAL DAIRY Co., Exeter.

R. & V. H. C.—T. ALLAN, Ryde Farm, Ripley, Surrey.

V. H. C.—Mrs. BARNETT, Mill End, Henley-on-Thames :—and Sir W. G. PEARCE, Bart., M.P., Chilton Lodge, Hungerford.

H. C.—Lt.-Col. J. CURTIS-HAYWARD, Quedgeley, Gloucester :—C. PARRY, Down House, Redmarley, near Newent, Gloucester :—W. B. RODERICK, Tonheulog, Llanelly, Carmarthenshire :—A. F. SOMERVILLE, Dinder House, Wells, Somerset :—and C. C. TUDWAY, Walcombe Dairy, Wells, Somerset.

C.—LORD MONTAGU, Palace House, Beaulieu, Hants :—and M. J. WILLIAMS, North Hill Farm, Chew Stoke.

CLASS 138.—3 lbs. of Fresh (or very slightly salted) Butter, in pound plain rolls or brick shapes, made by Students who had attended a course of instruction at any of the Society's Butter Schools. [14 entries.]

I. (£5).—Miss F. M. COLE, Home Farm, Tring, Herts.

II. (£3).—Miss G. LAWRENCE, Home Dairy Farm, Dinder, Wells, Somerset.

III.† (£2 10s.).—Miss P. WEAVER, Hounsley Farm, Winford, Bristol.

IV. (£2).—Miss M. J. WILLIAMS, Regilbury Park, Winford.

V. (£1).—Miss I. ALLAN, Ryde Farm, Ripley, Surrey.

R. & V. H. C.—Miss A. A. WALKER, Ockington, Dymock.

H. C.—Miss T. M. WEAVER, Hounsley Farm, Winford, Bristol.

CLASS 139.†—3 lbs. of Fresh (or very slightly salted) Butter, in pound plain rolls or brick shapes, made by a Student who has attended a course of instruction at any of the Society's or County Council Butter Schools held in Gloucestershire. [5 entries.]

I. (£5).—Mrs. E. R. BLACKWELL, Cowden Hall, Heathfield, Sussex.

II. (£3).—Mrs. A. PEARCE, Toddington, Cheltenham.

III. (£2).—Miss A. A. WALKER, Ockington, Dymock.

IV. (£1).—Miss S. S. SPARROW, Sellars Farm, Hardwicke, Gloucester.

R.—Miss B. KILSBY, Haddon Park End Road, Gloucester.

\* Given by the Gloucester Local Committee for the best entry in any of the utter Classes.

† Given by the Gloucester Local Committee.

**CLASS 140.**—12 lbs. of Salted Butter, in a jar or crock, to be delivered to the Secretary at the Guildhall, Gloucester, four weeks before Show. [20 entries.]

**I. (£4.)**—M. J. WILLIAMS, North Hill Farm, Chew Stoke.

**II. (£2.)**—J. WILLIAMS, Regilbury Park, Winford.

**III. (£1.)**—Miss I. BROWN, Court Farm, Failand, Bristol.

**IV. (10s.)**—LORD MONTAGU, Palace House, Beaulieu, Hants.

**R. & V. H. C.**—Mrs. J. WALKER, The Hill, Northleach.

**H. C.**—Miss J. F. HEDDITCH, Catherstone Farm, Charmouth :—and RIDDLE, Oldbury-on-Severn, Thornbury, R.S.O.

**C.**—CATHEDRAL DAIRY Co., Exeter :—Mrs. C. L. CULLIMORE, hampton, Gloucester :—Mrs. J. DAVIES, Trisissills, St. Nicholas, near guard, S. Wales :—Lt.-Col. CURTIS HAYWARD, Quedgeley, Gloucester W. G. PEARCE, Bart., M.P., Chilton Lodge, Hungerford :—and Miss E. Adsett Farm, Westbury-on-Severn, Gloucester.

**CLASS 141.**—4 half-pounds of Clotted or Devonshire Cream, in either in tins or earthen jars. [8 entries.]

**I. (£2.)**—W. BEER, Trinity Dairy, Barnstaple, Devon.

**II. (£1.)**—J. WILLIAMS, Regilbury Park, Winford.

**III. (10s.)**—T. MORRIS, Maisemore Court, Gloucester.

**R. & H. C.**—CATHEDRAL DAIRY Co., Exeter.

**C.**—LONDON, GLOUCESTER AND NORTH HANTS DAIRY Co., Whatley Clifton :—C. C. TUDWAY, Walcombe Dairy, Wells, Somerset :—and T. CROFT, Castle Farm, Dundry.

## BUTTER-MAKING COMPETITIONS.

(In the Working Dairy in the Show-yard. Not open to Makers or Venders of Churns or their Assistants, or to any previous winner of the Society's Gold Medal.)

These Prizes were awarded for the best and largest quantity of Butter from a given quantity of Cream in the cleanest and most approved manner.

**CLASS 142.**—On the first day of the Show, open only to Students who have attended a course of instruction at any of the Society's Schools. [41 entries.]

**I. (£5.)**—Miss I. ALLAN, Ryde Farm, Ripley, Surrey.

**II. (£3.)**—Miss A. M. WATTS, Fairgreen, Sarsden, Chipping Norton.

**III.\* (£2 10s.)**—Mrs. J. ANDREWS, North Elham, Canterbury.

**IV. (£1 10s.)**—Miss G. LAWRENCE, Home Dairy Farm, Dinder, W.

**V. (10s.)**—Miss L. SHERBORNE, Chelwood Farm, Chelwood, Bristol.

**R. & V. H. C.**—Miss F. M. COLE, Home Farm, Tring, Herts.

\* Given by the Gloucester Local Committee.

**H. C.**—Miss R. CHARLES, Great Wacton, Bromyard:—and Miss A. A. WALKER, Ockington, Dymock.

**C.**—Miss A. L. ASHMAN, Paulton, Bristol:—Miss L. J. BERROW, Westhyde, Hereford:—Miss J. Z. CALDWELL, Bosbury, Ledbury:—Miss L. M. CANDY, Manor Farm, Bathampton:—Miss S. A. H. DIGWOOD, The Chesterfields, Feckenham, Redditch:—Miss M. J. MARSHALL, Bradley Farm, Feckenham, near Redditch:—Miss A. W. PERRY, Downside College Dairy, Stratton-on-Fosse:—Mrs. S. SUMMERS, Walton, Midsomer Norton, Bath:—Mrs. M. YEATES, Barrow Court Farm, Flax Bourton:—and Miss H. C. WINGROVE, Bradenstoke Abbey, near Chippenham.

**CLASS 143.**—*On the second day of the Show, open to any woman, without restriction as to School.* [62 entries.]

**I. (£5.)**—Miss I. ALLAN, Ryde Farm, Ripley, Surrey.

**II. (£3.)**—Miss R. CHARLES, Great Wacton, Bromyard.

**III. (£1 10s.)**—Miss F. M. COLE, Home Farm, Tring, Herts.

**IV. (10s.)**—Mrs. J. ANDREWS, North Elham, Canterbury.

**R. & V. H. C.**—Mrs. E. R. BLACKWELL, Cowden Hall, Heathfield, Sussex.

**H. C.**—Miss A. L. ASHMAN, Paulton, Bristol:—Miss S. J. FOWLER, Perrott's Brook Dairy, Cirencester:—Miss G. LAWRENCE, Home Dairy Farm, Dinder, Wells:—Miss L. SHERBORNE, Chelwood Farm, Chelwood, Bristol:—Miss A. M. WATTS, Fairgreen, Sarsden, Chipping Norton:—and Miss H. M. JOSEPH, Blythwood Dairy, Stansted, Essex.

**C.**—Miss J. ALLAN, Ryde Farm, Ripley, Surrey:—Miss B. NUTLAND, Salthrop Dairy, Wroughton, Swindon:—Miss A. A. WALKER, Ockington, Dymock:—Miss T. M. WEAVER, Hounsley Farm, Winford:—and Mrs. M. YEATES, Barrow Court Farm, Flax Bourton.

**CLASS 144.**—*On the third day of the Show, open to any man or woman, except the winner of the 1st Prize in Class 143.* [46 entries.]

**I. (£4.)**—Mrs. J. ANDREWS, North Elham, Canterbury.

**I. (£4.)**—Mrs. M. YEATES, Barrow Court Farm, Flax Bourton.

**II. (£1.)**—Miss M. GREENAWAY, Ebbw Place, Ebbw Bridge, near Newport, Monmouth.

**II. (£1.)**—Miss B. NUTLAND, Salthrop Dairy, Wroughton.

**R. & V. H. C.**—Miss E. G. COOK, South Down Farm, Surbiton Hill.

**H. C.**—Miss A. L. ASHMAN, Paulton, Bristol:—Mrs. M. A. CAMBRIDGE, High Hall, Blymhill, Shifnal:—Miss R. CHARLES, Great Wacton, Bromyard:—Mrs. N. COMER, Upper House, Purley, Ledbury:—Miss E. E. MOSS, Reckfield Farm, near Monmouth:—Miss A. W. PERRY, Downside College Dairy, Stratton-on-the-Fosse:—and Miss L. SHERBORNE, Chelwood Farm, Chelwood, Bristol.

**C.**—Mrs. J. LL. BAKER, Lower House, Llanvair Discoed, near Chepstow:—Mrs. E. R. BLACKWELL, Cowden Hall, Heathfield, Sussex:—Miss F. M. COLE, Home Farm, Tring, Herts:—Miss S. A. H. DIGWOOD, The Chesterfields, Feckenham, Redditch:—Mrs. A. W. FARMER, Barrack Farm, Newport, Monmouth:—Miss S. J. FOWLER, Perrott's Brook Dairy, Cirencester:—Miss B. HOWES, Dolphin Hotel, Wincanton:—Miss F. HOWES, Dolphin Hotel, Wincanton:—Miss A. M. WATTS, Fairgreen, Sarsden, Chipping Norton:—and Miss H. C. WINGROVE, Bradenstoke Abbey, near Chippenham.

CLASS 145.—*On the fourth day of the Show, open to any man or woman, except the winners of the 1st Prizes in Classes 143 and 144. [40 entries.]*

I. (£5).—Miss A. A. WALKER, Ockington, Dymock.

II. (£3).—Mrs. M. A. CAMBRIDGE, High Hall, Blymhill, Shifnal.

III. (£1 10s).—Mrs. E. R. BLACKWELL, Cowden Hall, Heathfield, Sussex.

IV. (10s).—Miss E. G. COOK, South Down Farm, Surbiton Hill, Surrey.

R. & V. H. C.—Mrs. A. W. FARMER, Barrack Farm, Newport, Monmouth.

H. C.—Miss A. L. ASHMAN, Paulton, Bristol :—Mrs. J. LL. BAKER, Lower House, Llanvair Discoed, Chepstow, Monmouth :—Miss L. J. BERROW, Westhyde, Hereford :—Miss F. M. COLE, Home Farm, Tring, Herts :—Miss S. J. FOWLER, Perrott's Brook Dairy, Cirencester :—Miss M. GREENAWAY, Ebbw Place, Ebbw Bridge, near Newport, Monmouth :—Miss B. HOWES, Dolphin Hotel, Wincanton :—Miss L. SHERBORNE, Chelwood Farm, Chelwood, Bristol :—and Miss P. WEAVER, Hounsley Farm, Winford, Bristol.

C.—Miss M. J. MARSHALL, Bradley Green, Feckenham, Redditch :—Miss E. E. MOSS, Rockfield Farm, near Monmouth :—Miss A. W. PERRY, Downside College Dairy, Stratton-on-the-Fosse :—Miss U. O. THOMPSON, Glyn Cottage, Francis Street, Cheltenham.

CLASS 146.\*—*On the fourth day of the Show, open only to Students who have attended a course of instruction at any of the Society's or County Council Butter Schools held in Gloucestershire. [16 entries.]*

I. (£5).—Mrs. E. R. BLACKWELL, Cowden Hall, Heathfield, Sussex.

II. (£3).—Miss A. M. WATTS, Fairgreen, Sarsden, Chipping Norton.

III. (£1 10s).—Miss L. ROBINSON, Sandfield, North Nibley, near Dursley.

IV. (10s).—Miss E. A. ADAMS, Woodmancote, Dursley.

R. & V. H. C.—Miss S. S. SPARROW, Sellar's Farm, Hardwicke, Gloucester.

H. C.—Miss S. FLOWER, Aconbury Court, near Ross :—Miss M. A. MOSS, Quedgeley, Gloucester :—Miss L. WALKER, Ockington, Dymock :—and Miss BESSIE WEBB, Hardwicke Farm, near Gloucester.

C.—Miss B. ADAMS, 13, College Green, Gloucester :—Miss E. M. BENNETT, Down House, Dursley :—Miss K. E. BOYCOTT, Coalmoor House, Horsehay, R.S.O. :—and Miss B. KILSBY, Haddon Parkend Road, Gloucester.

#### CHAMPION PRIZES.

*Competed for on the fifth day of the Show by the winners of Prizes in Classes 142, 143, 144, 145, and 146.—First prize, a Gold Medal and the Society's Certificate—second, a Silver Medal and the Society's Certificate—third, a Bronze Medal and the Society's Certificate.*

I. (Gold Medal).—Miss M. YEATES, Barrow Court Farm, Flax Bourton.

II. (Silver Medal).—Mrs. M. A. CAMBRIDGE, High Hall, Blymhill, Shifnal.

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\* Given by the Gloucester Local Committee.

**III. (Bronze Medal).—**Miss E. G. COOK, South Down Farm, Surbiton Hill.

**R. & V. H. C.—**Miss R. CHARLES, Great Wacton, Bromyard.

**H. C.—**Miss I. ALLAN, Ryde Farm, Ripley, Surrey :—and Miss A. M. WATTS, Fairgreen, Sarsden, Chipping Norton.

**Extra Prizes to the value of £8 were given by the Gloucester Local Committee and placed at the disposal of the Judges for a Butter-making Competition on the fifth day of the Show.**

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## DAIRY APPLIANCES.

**CLASS 147.—***A Gold Medal was offered for the best Milking Machine.*

(The following were regarded as essential points in deciding upon the merits of the exhibits in Class 147 :—Efficiency; simplicity in working; and economy in cost.)

[No COMPETITION.]

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## HORSE-SHOEING COMPETITION.

**CLASS 148.—***Best Shoeing of a Nag Horse by a Smith in the Show Yard on the third day of Show.* [53 entries.]

A pair of Shoeing Models, presented by Mrs. Miles, of Dixfield House, Exeter, and a copy of Miles's 'Treatise on Shoeing,' was presented to each winner of a Prize.

Certificates of Commendation were awarded where deserved; and each commended Competitor was presented with a copy of Miles's 'Treatise on Shoeing.'

The Registration Committee of the Farriers' Company admitted all the winners of Prizes and Commendations in these Competitions to the Official Register *free of charge*, on their satisfying the Judges that they had a fair knowledge of the structure of the horse's foot, and on the necessary application being made to the Company in the prescribed form.

**I. (£5).—**P. L. WILLIAMS, Bargoed, near Cardiff.

**II. (£3).—**JAMES RUDGE, Brampton, Madley, Herefordshire.

**III. (£2).—**T. DAVIES, Rose Cottage, Cross Road, Sketty, Swansea.

**IV. (£1).—**W. HANCOCK, Whitfield, Tram Inn, Herefordshire.

**H. C.—**S. BAYLISS, Winchcombe, Gloucestershire :—E. DAVIES, R.S.S. 47, Castle Street, Merthyr Tydvil :—G. W. GABB, Saul, Stonehouse, Gloucestershire :—W. F. HAYDEN, Castle Street West, Banbury :—and E. OWENS, 47, Castle Street, Merthyr Tydvil.

**C.—**E. G. CAREY, 5, Canal Bridge, Widcombe, Bath :—W. T. DANIEL, Aberavon, Port Talbot :—J. DAVIES, 47, Castle Street, Merthyr Tydvil :—J. JONES, Pontybat, near Brecon :—and J. SANDERS, 52, Terrace Road, Swansea.

**CLASS 149.\*—Best Shoeing of a Cart Horse on the fourth day of Show.**  
[44 entries.]

**I. (£5.)—JAMES RUDGE, Bampton, Madley, Herefordshire.**

**II. (£3.)—J. SANDERS, 52, Terrace Road, Swansea.**

**III. (£2.)—H. C. FRANCIS, Green Fach Shoeing Forge, Aberdare.**

**IV. (£1.)—JOHN RUDGE, Bampton, Madley, Herefordshire.**

**V. H. C.—W. HOWELLS, Abercrave, Swansea Vale :—and H. MINTON, 109, White Cross Street, Hereford.**

**H. C.—E. G. CAREY, 5, Canal Bridge, Widcombe, Bath :—E. DAVIES, R.S.S., 47, Castle Street, Merthyr Tydvil :—D. FRANCIS, Post Office Lane, Merthyr :—and WILLIAM RUDGE, Bampton, Madley, Herefordshire.**

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\* Given by the Gloucester Local Committee.

## GLOUCESTER MEETING, 1893.

### Award of Prizes for Poultry.

Abbreviations used.—y., year; m., month; w., week; d., day; V. H. C., Very Highly Commended; H. C., Highly Commended; C., Commended.

#### SECTION I.—GENERALLY USEFUL BREEDS.

##### CLASS 1.—COCHIN (CINNAMON and BUFF) COCKS. [3 entries.]

- I. (£1 10s.)—Mrs. S. R. HARRIS, *buff*.
- II. (15s.)—A. E. W. DARBY, *buff*, over 1 y.
- III. (5s.)—Mrs. S. R. HARRIS, *buf*.

##### CLASS 2.—COCHIN (CINNAMON and BUFF) HENS. [3 entries.]

- I. (£1 10s.)—Mrs. S. R. HARRIS, *buff*.
- II. (15s.)—Mrs. S. R. HARRIS, *buff*.
- III. (5s.)—J. WHICHER, *buff*, 2 y.

##### CLASS 3.—COCHIN (PARTRIDGE-FEATHERED OR WHITE) COCKS. [5 entries.]

- I. (£1 10s.)—Miss E. ROUSE, 20 m.
- II. (15s.)—R. W. WEBSTER, *partridge*, 18 m.
- III. (5s.)—J. A. SLATTER.

##### CLASS 4.—COCHIN (PARTRIDGE-FEATHERED OR WHITE) HENS. [5 entries.]

- I. (£1 10s.)—Miss E. ROUSE, 20 m.
- II. (15s.)—J. H. NICHOLLS, over 1 y.
- III. (5s.)—A. E. MORGAN, *white*, 2 y., 1 m.

##### CLASS 5.—BRAHMA (DARK) COCKS. [4 entries.]

- I. (£1 10s.)—S. W. THOMAS, over 1 y.
- II. (15s.)—J. BROOKE, over 1 y.
- III. (5s.)—Mrs. A. CAMPBELL, 1 y.
- H. C.—W. C. MIDDLETON.

##### CLASS 6.—BRAHMA (DARK) HENS. [5 entries.]

- I. (£1 10s.)—S. W. THOMAS, over 1 y.
- II. (15s.)—C. J. ELSE, 2 y.
- III. (5s.)—P. L. BENSON, M.D., 2 y.
- H. C.—Mrs. A. CAMPBELL, 2½ y.

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## CLASS 7.—BRAHMA (LIGHT) COCKS. [6 entries.]

- I. (£1 10s.)—E. SCAMMELL, 4 y.
- II. (15s.)—E. SCAMMELL, 3 y.
- III. (5s.)—W. C. MIDDLETON.
- H. C.—E. H. OSMAN, 13 m.

## CLASS 8.—BRAHMA (LIGHT) HENS. [5 entries.]

- I. (£1 10s.)—E. LINNELL, over 1 y.
- II. (15s.)—J. BROOKE.
- III. (5s.)—R. W. WEBSTER, 18 m.
- H. C.—Mrs. S. A. CROOK, over 1 y.

## CLASS 9.—LANGSHAN COCKS. [13 entries.]

- I. (£1 10s.)—Rev. G. T. LAYCOCK.
- II. (15s.)—P. MARSH, 3 y.
- III. (5s.)—C. SEABROOKE, over 1 y.
- H. C.—Rev. G. T. LAYCOCK :—H. P. NICHOLL, 1 y., 2 m.

## CLASS 10.—LANGSHAN HENS. [9 entries.]

- I. (£1 10s.)—H. R. WILLETT, 11 m.
- II. (15s.)—C. SEABROOKE, over 1 y.
- III. (5s.)—Rev. G. T. LAYCOCK.
- H. C.—R. H. CAZALET, 1892 :—and H. WALLIS.

## CLASS 11.—PLYMOUTH ROCK COCKS. [7 entries.]

- I. (£1 10s.)—R. PRATER, 11 m., 2 w.
- II. (15s.)—W. E. DAINTON, 14 m.
- III. (5s.)—R. J. BROWNING, 15 m.
- C.—S. W. THOMAS, over 1 y.

## CLASS 12.—PLYMOUTH ROCK HENS. [4 entries.]

- I. (£1 10s.)—A. THOMAS, over 1 y.
- II. (15s.)—W. E. DAINTON.
- III. (5s.)—P. PARFITT, 2 y., 1 w.
- C.—S. W. THOMAS, over 1 y.

## CLASS 13.—WYANDOTTE COCKS. [12 entries.]

- I. (£1 10s.)—O. F. BATES, *silver*.
- II. (15s.)—W. A. SPENCER, 13 m.
- III. (5s.)—Mrs. W. B. GOODE, *golden*.
- H. C.—C. BUTCHER, *golden*, 2 y. :—and D. ILES, *silver*, 16 m.

*Prizes awarded for Poultry.*

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CLASS 14.—WYANDOTTE HENS. [9 entries.]

- I. (£1 10s.)—J. R. BENNETT, *silver*, 12 m.
- II. (15s.)—W. W. and C. D. Low, *silver*, over 1 y.
- III. (5s.)—O. F. BATES, *golden*.
- C.—W. MOODY, *silver*, 12 m. :—and W. TARVER, *silver*, 4 y.

CLASS 15.—ORPINGTON COCKS. [8 entries.]

- I. (£1 10s.)—W. COOK, 15 m.
- II. (15s.)—R. DE COURCY PEELE, 14 m.
- III. (5s.)—J. H. BRYANT, 14 m.
- H. C.—V. G. HUNTLEY.

CLASS 16.—ORPINGTON HENS. [6 entries.]

- I. (£1 10s.)—W. MCKENZIE BRADLEY and F. J. W. OAKLEY, 14 m.
- II. (15s.)—W. MCKENZIE BRADLEY and F. J. W. OAKLEY, 14 m.
- III. (5s.)—W. COOKE, 13 m.

CLASS 17.—CHICKENS OF 1893 (COCHIN, BRAHMA, LANGSHAN, PLYMOUTH ROCK, WYANDOTTE, or ORPINGTON)—COCKERELS. [11 entries.]

- I. (£1 10s.)—J. H. NICHOLLS, *Cochin*, hatched January 3rd, 1893.
- II. (15s.)—Rev. G. T. LAYCOCK.
- III. (5s.)—A. G. PHILLIPS, *Langshan*, hatched January 2nd.

CLASS 18.—CHICKENS OF 1893 (COCHIN, BRAHMA, LANGSHAN, PLYMOUTH ROCK, WYANDOTTE, or ORPINGTON)—PULLETS. [11 entries.]

- I. (£1 10s.)—Rev. G. T. LAYCOCK.
- II. (15s.)—Mrs. E. H. LONDON, *Silver Wyandotte*.
- III. (5s.)—O. TONKS, *Plymouth Rock*, hatched January 24th.

SECTION II.—LAYING OR NON-SETTING BREEDS.

CLASS 19.—SPANISH COCKS. [3 entries.]

- I. (£1 10s.)—F. HARVEY, 1 y.
- II. (15s.)—A. J. ANDREWS, 12 m.
- III. (5s.)—J. HUNT, over 1 y.

CLASS 20.—SPANISH HENS. [5 entries.]

- I. (£1 10s.)—J. AUCLAND.
- II. (15s.)—J. C. BOWES, 18 m.
- III. (5s.)—J. HUNT, over 1 y.
- H. C.—J. HUNT, over 1 y.

## CLASS 21.—MINORCA COCKS. [9 entries.]

- I. (£1 10s.)—A. G. PITTS, 13 m.
- II. (15s.)—J. HARWOOD, 16 m.
- III. (5s.)—H. R. WILLETT, 11 m.
- H. C.—J. W. CROSSMAN, 1 y.:—F. KENDALL, 1 y.:—and A. 13 m.

## CLASS 22.—MINORCA HENS. [10 entries.]

- I. (£1 10s.)—A. G. PITTS, 7 y.
- II. (15s.)—A. G. PITTS, 1 y.
- III. (5s.)—R. YEO, 13 m.
- V. H. C.—L. NEWICK, 2 y.
- H. C.—FORD and SLATER:—and M. WOOTTEN, 1 y.

## CLASS 23.—LEGHORN (ANY VARIETY) COCKS. [4 entries.]

- I. (£1 10s.)—J. ENGLAND, 12 m.
- II. (15s.)—J. PRIDE, 1892.
- III. (5s.)—G. F. HIGGINSON, *brown*, 1892.

## CLASS 24.—LEGHORN (ANY VARIETY) HENS. [4 entries.]

- I. (£1 10s.)—H. and A. P. SIMPSON, 1892.
- II. (15s.)—J. PRIDE, 1892.
- III. (5s.)—E. J. DAVIES.

## CLASS 25.—HOUDAN COCKS. [4 entries.]

- I. (£1 10s.)—S. W. THOMAS, over 1 y.
- II. (15s.)—J. H. BRODRICK, over 1 y.
- III. (5s.)—S. W. THOMAS, over 1 y.
- H. C.—F. GABITAS, over 1 y.

## CLASS 26.—HOUDAN HENS. [4 entries.]

- I. (£1 10s.)—F. GABITAS, over 1 y.
- II. (15s.)—S. W. THOMAS, over 1 y.
- III. (5s.)—S. W. THOMAS, over 1 y.
- H. C.—Rev. F. COOKE, over 1 y.

## CLASS 27.—POLISH FOWL, COCKS. [3 entries.]

- I. (£1 10s.)—A. SMITH.
- II. (15s.)—J. RAWNSLEY.
- III. (5s.)—A. E. MORGAN, various.

## CLASS 28.—POLISH FOWL, HENS. [3 entries.]

- I. (£1 10s.)—D. W. LEWIS, over 1 y.
- II. (15s.)—J. RAWNSLEY.
- III. (5s.)—A. E. MORGAN, various.

**CLASS 29.—HAMBURG (GOLDEN SPANGLED) COCKS. [5 entries.]**

- I. (£1 10s.)—J. RAWNSLEY.**
- II. (15s.)—H. PICKLES.**
- III. (5s.)—W. SNELL, 14 m.**
- H. C.—W. and J. JACKSON :—and H. R. PLATTIN, 15 m.**

**CLASS 30.—HAMBURG (GOLDEN SPANGLED) HENS. [5 entries.]**

- I. (£1 10s.)—W. and J. JACKSON.**
- II. (15s.)—H. PICKLES**
- III. (5s.)—J. RAWNSLEY.**
- H. C.—H. R. PLATTIN, 2 y. :—and W. SNELL, 14 m.**

**CLASS 31.—HAMBURG (SILVER SPANGLED) COCKS. [4 entries.]**

- I. (£1 10s.)—Rev. S. ASHWELL, 10 m.**
- II. (15s.)—H. PICKLES.**
- III. (5s.)—E. CORKE, 1892.**
- V. H. C.—G. THORNBURY, 14 m.**

**CLASS 32.—HAMBURG (SILVER SPANGLED) HENS. [6 entries.]**

- I. (£1 10s.)—H. PICKLES.**
- II. (15s.)—G. THORNBURY, 14 m.**
- III. (5s.)—E. CORKE, 1891.**
- H. C.—W. and J. JACKSON.**

**CLASS 33.—HAMBURG (GOLDEN PENCILLED) COCKS. [3 entries.]**

- I. (£1 10s.)—J. RAWNSLEY.**
- II. (15s.)—H. PICKLES.**
- III. (5s.)—E. CORKE, 1892.**

**CLASS 34.—HAMBURG (GOLDEN PENCILLED) HENS. [6 entries.]**

- I. (£1 10s.)—H. PICKLES.**
- II. (15s.)—E. CORKE, 1892.**
- III. (5s.)—E. CORKE, 1892.**
- H. C.—J. RAWNSLEY :—and J. WHITE, 2 y., 11 m.**

**CLASS 35.—HAMBURG (SILVER PENCILLED) COCKS. [3 entries.]**

- I. (£1 10s.)—H. PICKLES.**
- II. (15s.)—A. MACKAY, 13 m.**
- III. (5s.)—J. RAWNSLEY.**

**CLASS 36.—HAMBURG (SILVER PENCILLED) HENS. [2 entries.]**

- I. (£1 10s.)—H. PICKLES.**
- II. (15s.)—J. RAWNSLEY.**

**CLASS 37.—HAMBURG (BLACK) COCKS. [5 entries.]****I. (£1 10s.)—H. PICKLES.****II. (15s.)—Rev. G. T. LAYCOCK.****III. (5s.)—Rev. G. T. LAYCOCK.****H. C.—A. HARROWING.****CLASS 38.—HAMBURG (BLACK) HENS. [6 entries.]****I. (£1 10s.)—H. PICKLES.****II. (15s.)—S. PILLING, 14 m.****III. (5s.)—D. W. LEWIS, over 1 y.****V. H. C.—G. HARRIS, 1 y. :—T. J. HEARNDEN :—and Rev. G. T. LAYCOCK.****CLASS 39.—CHICKENS OF 1893 (SPANISH, MINORCA, LEGHORN, HOUDAN, POLISH, OR HAMBURG)—COCKERELS. [4 entries.]****I. (£1 10s.)—J. THORN, *black Minorca*, 4 m., 18 d.****II. (15s.)—G. F. HIGGINSON, *brown Leghorn*, Jan. 4th, 1893.****III. (5s.)—A. TUCKER, *Minorca*, 4 m., 5 d.****CLASS 40.—CHICKENS OF 1892 (SPANISH, MINORCA, LEGHORN, HOUDAN, POLISH, OR HAMBURG)—PULLETS. [3 entries.]****I. (£1 10s.)—A. TUCKER, *Minorca*, 4 m., 5 d.****II. (15s.)—G. F. HIGGINSON, *brown Leghorn*, Jan. 4th, 1893.****III. (5s.)—W. H. STOYEL, *black Minorca*, 4 m., 2 w.****SECTION III.—BREEDS SUITABLE FOR THE TABLE****CLASS 41.—DORKING (COLOURED) COCKS. [2 entries.]****I. (£1 10s.)—J. HARRIS, over 1 y.****II. (15s.)—E. T. GARDOM, 1 y.****CLASS 42.—DORKING (COLOURED) HENS. [4 entries.]****I. (£1 10s.)—R. B. CURTEIS, 2 y.****II. (15s.)—J. HARRIS, over 1 y.****III. (5s.)—A. THOMAS, over 1 y.****CLASS 43.—DORKING (SILVER GREY) COCKS. [5 entries.]****I. (£1 10s.)—R. CHEESEMAM, 2 y., 3 m.****II. (15s.)—O. E. CRESSWELL, over 1 y.****III. (5s.)—Capt. G. P. HORNBY.****H. C.—J. PETTIPHER, over 1 y.****CLASS 44.—DORKING (SILVER GREY) HENS. [7 entries.]****I. (£1 10s.)—O. E. CRESSWELL, over 1 y.****II. (15s.)—J. CLUNAS, 16 m.**

**III. (5s.)**—R. CHRESMAN, 2 y., 3 m.

**C.**—J. CLUNAS, 16 m.

**CLASS 45.—DORKING (WHITE OR CUCKOO) COCKS.** [7 entries.]

**I. (£1 10s.)**—O. E. CRESSWELL, *white*, over 1 y.

**II. (15s.)**—J. WOODCOCK, *white*, 12 m.

**III. (5s.)**—O. E. CRESSWELL, *white*, over 1 y.

**C.**—W. H. COPPLESTONE, *cuckoo*, over 1 y.

**CLASS 46.—DORKING (WHITE OR CUCKOO) HENS.** [6 entries.]

**I. (£1 10s.)**—A. E. W. DARBY.

**II. (15s.)**—O. E. CRESSWELL, *white*, over 1 y.

**III. (5s.)**—W. H. COPPLESTONE, *cuckoo*, over 1 y.

**C.**—O. E. CRESSWELL, *white*, over 1 y.

**CLASS 47.—GAME (BLACK-BREADED REDS) COCKS.** [6 entries.]

**I. (£1 10s.)**—C. W. BRIERLEY, over 1 y.

**II. (15s.)**—W. T. GARNE.

**III. (5s.)**—Miss N. J. W. PHILLIPS.

**H. C.**—W. T. GARNE:—C. F. W. JACKSON, over 1 y.:—and F. C. TOMKINS.

**CLASS 48.—GAME (BLACK-BREADED REDS) HENS.** [6 entries.]

**I. (£1 10s.)**—C. W. BRIERLEY, over 1 y.

**II. (15s.)**—F. C. TOMKINS.

**III. (5s.)**—F. C. TOMKINS.

**H. C.**—C. F. W. JACKSON, over 1 y.

**CLASS 49.—GAME (BROWN-BREADED REDS) COCKS.** [5 entries.]

**I. (£1 10s.)**—C. W. BRIERLEY, over 1 y.

**II. (15s.)**—J. W. BROCKBANK.

**III. (5s.)**—A. H. SIMS.

**CLASS 50.—GAME (BROWN-BREADED REDS) HENS.** [4 entries.]

**I. (£1 10s.)**—C. W. BRIERLEY, over 1 y.

**II. (15s.)**—C. W. BRIERLEY, over 1 y.

**III. (5s.)**—J. W. BROCKBANK.

**V. H. C.**—J. C. HUXTABLE, over 1 y.

**CLASS 51.—GAME (PILE OR ANY OTHER VARIETY) COCKS.** [7 entries.]

**I. (£1 10s.)**—C. W. BRIERLEY, over 1 y.

**II. (15s.)**—J. C. HUXTABLE, *Pile*, over 1 y.

**III. (5s.)**—HARRIS BROS., *Pile*, 11 m.

V. H. C.—G. L. FIGGURES, *Birchen grey*, 2 y.

H. C.—J. W. BROCKBANK :—and J. WEAVER, *Pile*, 1892.

CLASS 52.—GAME (PILE OR ANY OTHER VARIETY) HENS. [6 entries.]

I. (£1 10s.)—C. W. BRIERLEY, over 1 y.

II. (15s.)—J. C. HUXTABLE, *Pile*, over 1 y.

III. (5s.)—J. W. BROCKBANK.

V. H. C.—J. B. WEEKS, *Pile*, 13 m.

H. C.—HARRIS BROS., *Pile*, 11 m. :—and J. WEAVER, *Pile*, 1892.

CLASS 53.—GAME (OLD ENGLISH) COCKS. [15 entries.]

I. (£1 10s.)—E. BARNES, 1891.

II. (15s.)—HARRIS and BLACKSTOCK.

III. (5s.)—G. F. SAUL, 2 y., 6 m.

V. H. C.—HARRIS and BLACKSTOCK :—and R. DE COURCY PEELE, 15 m.

H. C.—H. ATKINSON, 2 y. :—H. SCOTT HALL, 1 y., 2 m. :—Rev. H. W. HUTTON, 14 m. :—and J. NIXON.

CLASS 54.—GAME (OLD ENGLISH) HENS. [13 entries.]

I. (£1 10s.)—Rev. H. W. HUTTON, over 1 y.

II. (15s.)—J. NIXON.

III. (5s.)—R. DE COURCY PEELE, over 2 y.

H. C.—H. ATKINSON, over 1 y. :—E. BARNES, 1892 :—H. SCOTT HALL, 2 y., 2 m. :—and G. F. SAUL, 2 y.

CLASS 55.—MALAY COCKS. [7 entries.]

I. (£1 10s.)—JOHN FRAYN, 1891.

II. (15s.)—G. F. WARD, over 1 y.

III. (5s.)—J. C. HUXTABLE, over 1 y.

V. H. C.—G. F. WARD, over 1 y. (twice).

CLASS 56.—MALAY HENS. [8 entries.]

I. (£1 10s.)—JOHN FRAYN, hatched 1891.

II. (15s.)—A. E. PARISH, over 18 m.

III. (5s.)—J. C. HUXTABLE.

V. H. C.—J. C. HUXTABLE, over 1 y.

H. C.—G. F. WARD, over 1 y. :—and his, over 1 y. :—and his, over 1 y.

CLASS 57.—INDIAN GAME COCKS. [4 entries.]

I (£1 10s.)—JAMES FRAYNE, various.

II. (15s.)—JOHN FRAYN, over 1 y.

III. (5s.)—H. PAYNTER.

H. C.—F. A. PALMER, 2 y., 2 m.

CLASS 58.—INDIAN GAME HENS. [3 entries.]

I. (£1 10s.)—JOHN FRAYN, over 1 y.

II. (15s.)—JAMES FRAYNE, various.

III. (5s.)—H. PAYNTER.

CLASS 59.—ANY OTHER DISTINCT VARIETY NOT MENTIONED—  
COCKS. [3 entries.]

I. (£1 10s.)—J. H. BRODRICK, *Crève Cœur*, over 1 y.

II. (15s.)—S. W. THOMAS, *Crève*, over 1 y.

III. (5s.)—R. DE COURCY PEELE, *Aseel*, over 2 y.

CLASS 60.—ANY OTHER DISTINCT VARIETY NOT MENTIONED—  
HENS. [3 entries.]

I. (£1 10s.)—J. H. BRODRICK, *Crève Cœur*, over 1 y.

II. (15s.)—S. W. THOMAS, *Crève*, over 1 y.

III. (5s.)—R. DE COURCY PEELE, *Aseel*, over 2 y.

CLASS 61.—CHICKENS OF 1893 (DORKING, GAME, MALAY, INDIAN GAME,  
OR ANY OTHER VARIETY NOT MENTIONED)—COCKEBELS. [6 entries.]

I. (£1 10s.)—JAMES FRAYNE, *Indian Game*, January, 1893.

II. (15s.)—E. A. PARISH, *Malay*, 5 m.

III. (5s.)—H. J. MILWARD, 3 m., 22 d.

H. C.—JOHN FRAYN, *Indian Game*, 1893.

CLASS 62.—CHICKENS OF 1893 (DORKING, GAME, MALAY, INDIAN GAME,  
OR ANY OTHER VARIETY NOT MENTIONED)—PULLETS. [5 entries.]

I. (£1 10s.)—G. F. WARD, *Malay*, 5 m.

II. (15s.)—E. A. PARISH, 5 m.

III. (5s.)—JOHN FRAYN, *Indian Game*, 1893.

CLASS 63.—CHICKENS OF 1893—(EITHER PURE-BRED OR CROSS-BRED)—  
TWO COCKERELS. [4 entries.]

I. (£1 10s.)—J. M. STOCKBRIDGE, *Silver-grey Dorkings*, 4 m., 3 d.

II. (15s.)—O. TONKS, *Plymouth Rock*, January 1st, 1893.

CLASS 64.—CHICKENS OF 1893—(EITHER PURE-BRED OR CROSS-BRED)—  
TWO PULLETS. [3 entries.]

I. (£1 10s.)—JAMES FRAYNE, *Indian Game*, January, 1893.

II. (15s.)—MISS M. DOLBEN, *White Dorking—Game*, 4 m.

III. (5s.)—JOHN FRAYN, *Indian Game*, 1893.



## Selling Classes.

CLASS 65.\*—ANY DISTINCT BREED (PRICE NOT TO EXCEED £1 1s.)—  
COCKS. [17 entries.]

I. (£1 10s.)—JOHN FRAYN, *Indian Game*, over 1 y.

II. (15s.)—J. HUNT, *Spanish*, over 1 y.

III. (5s.)—R. BACH, *coloured Dorking*.

H. C.—L. BRAZINGTON, *dark Dorking*, 2 y.:—R. J. BROWNING, *silver Wyandotte*, 1891:—G. COLLINS, *black-red Game*, about 2 y.:—A. E. W. DARBY:—T. J. HEARNDEN, *Langshan*, 1892:—G. F. HIGGINSON:—HILL and BURGE, *Game*, 11 m.:—and W. A. SPENCER, *silver Wyandotte*, 8 m.

CLASS 66.\*—ANY DISTINCT BREED (PRICE NOT TO EXCEED £1 1s.)—  
HENS. [8 entries.]

I. (£1 10s.)—J. AUCLAND, *black Spanish*.

II. (15s.)—J. SCOTT, *Indian Game*, 2 y.

III. (5s.)—J. HUNT, *Spanish*, over 1 yr.

H. C.—P. MARSH, *Langshan*, 13 m.:—and G. F. WARD, *Malay*.

CLASS 67.\*—ANY DISTINCT BREED (PRICE NOT TO EXCEED 30s.)—  
COCK AND HEN [14 entries.]

I. (£1 10s.)—W. M. DAVIES, *black Hamburgs*, 14 m. and 18 m.

II. (15s.)—J. HINTON, *Orpingtons*, 14 m. and 2 y.

III. (5s.)—E. SCAMMELL, *partridge Cochins*.

V. H. C.—J. BROOKE, *dark Brahmas*, over 1 y.:—J. SCOTT, *Indian Game*, 2 y.:—and W. SNELL, *black Minorcas*, various.

H. C.—MRS. A. CAMPBELL, *dark Brahmas*, 1 y. and 3 y.:—and P. PARFITT, *Pile Game*, 2 y., 10 m., and 2 y., 1 w.

## SECTION IV.—DUCKS, GEESE, AND TURKEYS.

CLASS 68.—DRAKE OR DUCK (ROUEN OR AYLESBURY). [4 entries.]

I. (£1 10s.)—H. R. WILLETT, *Aylesbury*, 10 m.

II. (15s.)—H. R. WILLETT, *Rouen*, 10 m.

III. (5s.)—H. R. WILLETT, *Aylesbury*, 10 m.

CLASS 69.—DRAKE OR DUCK (PEKIN). [12 entries.]

I. (£1 10s.)—H. G. WITHERS.

II. (15s.)—T. ALLEN, 1891.

III. (5s.)—H. R. WILLETT, 10 m.

H. C.—W. AVERY:—MRS. F. DAVIS, various:—and H. R. WILLETT, 10 m.

\* Given by the Gloucester Local Committee.

**CLASS 70.—COUPLE OF DUCKLINGS (ANY PURE OR CROSS-BRED VARIETY). [6 entries.]**

**I. (£1 10s.)**—A. HARROWING, *Aylesbury*, 4 m., 10 d.

**II. (15s.)**—E. BARNES, *Aylesbury*, 10 w.

**III. (5s.)**—A. G. PHILLIPS.

**H. C.**—H. R. WILLETT, 7 w.

**CLASS 71—GANDER OR GOOSE (ANY VARIETY). [8 entries.]**

**I. (£1 10s.)**—W. E. DANTON, 2 y.

**II. (15s.)**—E. SHAW, *Toulouse*, 2 y.

**III. (5s.)**—Mrs. A. BAYLDON, *Toulouse*, 1 y., 1 m.

**H. C.**—T. and S. BRADBURNE, 12 m.

**CLASS 72.—TURKEYS (COCK OR HEN). [6 entries.]**

**I. (£1 10s.)**—R. BACH, *bronze*, 1 y., 2 w.

**II. (15s.)**—Mrs. A. DIGHTON, 18 m.

**III. (5s.)**—H. SMITH, 13 m.

*Selling Class.*

**CLASS 73.\*—PAIR OF DUCKS (PRICE NOT TO EXCEED 25s.). [3 entries.]**

**I. (£1 10s.)**—Mrs. F. DAVIS, *Pekins*, various.

**II. (15s.)**—A. G. PHILLIPS.

**III. (5s.)**—F. H. VICK, *Aylesbury*, 12 m.

**SECTION V.—FANCY BREEDS.**

**CLASS 74.—BANTAM (BLACK OR WHITE) COCKS. [10 entries.]**

**I. (£1.)**—H. PICKLES.

**II. (10s.)**—C. E. CRESSWELL, *white*, over 1 y.

**III. (5s.)**—J. CRUNDWELL, *black*, 1892.

**V. H. C.**—A. HARWOOD, *black*, 1892 :—A. HARWOOD, *black*, 1892 :—and A. E. MORGAN, *black*, 1 y.

**CLASS 75.—BANTAM (BLACK OR WHITE) HENS. [7 entries.]**

**I. (£1.)**—W. BIRCHALL, *black*, 1 y.

**II. (10s.)**—O. E. CRESSWELL, *white*, over 1 y.

**III. (5s.)**—J. CRUNDWELL, *black*, 1892.

**H. C.**—H. PICKLES.

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\* Given by the Gloucester Local Committee.

## CLASS 76.—BANTAM (GAME, ANY VARIETY) COCKS. [8 entries.]

I. (£1.)—J. COOMS.

II. (10s.)—J. W. MAYO, 12 m.

III. (5s.)—Lady ALINGTON, over 1 y.

H. C.—E. CORKE, 1892 :—and J. WEAVER, 1892.

## CLASS 77.—BANTAM (GAME, ANY VARIETY) HENS. [9 entries.]

I. (£1.)—J. COOMS.

II. (10s.)—E. CORKE, 1892.

III. (5s.)—J. W. MAYO, 12 m.

H. C.—J. C. HUXTABLE, over 1 y.

## CLASS 78.—BANTAM (ANY OTHER DISTINCT VARIETY) COCKS. [4 entries.]

I. (£1.)—O. E. CRESSWELL, *Japanese*, over 1 y.II. (10s.)—J. COOMS, *Sebright*.

III. (5s.)—J. RAWNSLEY.

H. C.—O. E. CRESSWELL, *Japanese*, over 1 y.

## CLASS 79.—BANTAM (ANY OTHER DISTINCT VARIETY) HENS. [7 entries.]

I. (£1.)—O. E. CRESSWELL, *Japanese*, over 1 y.II. (10s.)—J. COOMS, *Sebright*.III. (5s.)—O. E. CRESSWELL, *Japanese*, over 1 y.

H. C.—J. RAWNSLEY.



## Bath and West and Southern Counties Society.

### TERMS OF MEMBERSHIP.

#### *Annual Subscriptions.*

Governors, who are eligible for election as President or Vice-President, not less than . . . . .	2l.
Ordinary Members, not less than . . . . .	1l.
Tenant Farmers, the rateable value of whose holdings does not exceed 200l. a-year, not less than. . . . .	10s.

#### *Life Compositions.*

Governors may compound for their Subscriptions for future years by payment, in advance, of 20l.; and Members by payment, in advance, of 10l. Governors and Members who have subscribed for not less than 20 years may become Life Members on payment of half these amounts.

Any person desirous of joining the Society can be proposed by a Member, or by the Secretary (THOS. F. PLOWMAN, 4, Terrace Walk, Bath).

### SUMMARY OF PRIVILEGES.

#### *Governors and Ordinary Members.*

1. To receive the Society's Annual 'Journal' free of expense. (See page lxii.)
2. To obtain opinions and analyses with regard to Manures, Soils, Feeding Stuffs, &c., at very low rates. (See page lxii.)
3. To obtain reports and results of examinations of Seeds and Plants at very low rates. (See page lxii.)
- \*4. To make an unlimited number of Stock and other Entries at the Society's Annual Exhibitions at reduced fees. (See page lxii.)
5. To be admitted free during the *whole time* of the Annual Exhibition, and to the reserved seats in the Grand Stand, the Working Dairy, and the Military Band Enclosure. (See page lxii.)
6. To use the Special Pavilion for Reading, Writing, &c., provided for Governors and Members attending the Annual Exhibitions.
7. To take part in the Society's Experiments on Crops, &c., and to receive reports thereon. (See page lxii.)
8. To be admitted free to witness the Teaching and Competitions at any of the Society's Dairy Schools. (See page lxiii.)

#### 10s. Members. :

Members subscribing less than 1l. are entitled to all the above-named privileges except No. 4, and in the case of No. 5, the Ticket is available for *one day only* instead of for the whole time of the Exhibition.

\* This privilege is confined to Governors or Members elected on or before the last Tuesday in January preceding the Show.

*Governors' Special Privileges.*

Governors are entitled, in addition to the privileges already mentioned, to an Extra Season Ticket for the Annual Exhibition and for the Reserved Seats in the Grand Stand, the Working Dairy, and the Military Band Enclosure. Governors subscribing more than 2*l.* are entitled to a further Ticket for every additional 1*l.* subscribed.

THE SOCIETY'S OPERATIONS.

*The Journal.*

The 'Journal,' which is published annually, bound in cloth, has for its aim the dissemination of Agricultural knowledge in a popular form, and affords a medium for recording and discussing the chief topics of interest in this direction which have been ventilated during the year. In addition to original articles by well-known agricultural authorities, it contains Reports on the Live Stock, Implements, &c., exhibited at the Society's Shows, particulars of the Society's general operations, prize awards, financial statements, lists of Members, reviews of new books on Agriculture, &c. (The price of the 'Journal' to non-Members is 6*s.* 5*d.*, post free.)

*Annual Exhibitions.*

The Society's Exhibitions are held annually in one of the centres of the various districts included in the Society's area of operations.

Prizes to a large amount are given for Horses, Cattle, Sheep, Pigs, Dairy Produce, &c.

Entries can be made by Members (elected on or before the last Tuesday in January preceding the Show) at 10*s.* per entry for Horses, and 5*s.* per entry for Cattle, Sheep, and Pigs. Non-Members are required to pay 1*l.* per entry for Horses and 15*s.* per entry for the other Stock named.

Provision is also made for the exhibition of Agricultural Implements and Machinery, Seeds, Cattle Foods, Artificial Manures, and articles of general utility. An entry fee, in addition to the charge for space, is payable by Non-Members.

A substantially-built and completely-equipped Working Dairy on a large scale is a special feature of the Annual Exhibitions. Here lectures, discussions, explanatory demonstrations, and comparative tests of implements and processes are carried on with the assistance of well-known practical and scientific experts. On each day of the Exhibition Butter-making Competitions for valuable prizes are held for farmers' wives and daughters, and dairymen and women.

Among other features of the Annual Meeting are Horse-Shoeing Competitions, Poultry and Horticultural Shows, and Exhibitions illustrative of Bee-keeping, Home Industries, Art Manufactures, and the Fine Arts.

*Experiments.*

Experiments on crops are conducted at experimental stations in various parts of the kingdom, the results of which are published in the Society's 'Journal.' The special objects of this department are:—

- a. To test the advantages, or otherwise, of the use of artificial manures, on corn, grass and roots, on land in ordinary farming condition, based on the results obtained from the Rothamsted and Woburn Experiments.

- b. To examine, test, and exhibit any new processes for dealing with agricultural produce which appear likely to be beneficial.
- c. To collect and publish information on new systems of cultivation, routine of crops, or other efforts which are being made for the profitable cultivation of land under low prices of corn.

The Society has also an Experimental section in connection with its Cheese School, to which is attached a laboratory. Here systematic investigations are conducted by a scientific staff, acting in conjunction with practical experts. Detailed reports of these investigations are given in the Society's Journal.

#### *Technical Education.*

With a view to promoting Technical Education in Agriculture, and in dairying especially, the Society undertakes (as far as its arrangements will permit) to provide travelling Butter Schools fully equipped with competent teachers, plant, &c., for public bodies within its area of operations. At the present time the Society is conducting Schools, wherein daily instruction is given to Students, for two County Councils.

The Society has also a fixed Cheese School in Somerset, where Students are received and boarded.

Both the Butter and Cheese Schools are under the inspection of the Board of Agriculture, which has shown its appreciation of the work by substantial grants in aid.

#### *Fine Art and Art-Manufactures.*

One of the objects for which the Society was founded was the encouragement of Arts as well as Agriculture, and, to this end, an exhibition of paintings and Art-Manufactures is annually held in Galleries erected in the Society's Show Yard.

The special aims of the Society in maintaining this department are:—

- 1st. The encouragement of young artists, especially, and of local efforts to bring art-workmanship to bear in the production of decorative or useful articles.
- 2nd. The exhibition of such art treasures as there may be in private or other collections, to which the public ordinarily have no access.

No charge is made to Artists for the exhibition of their Paintings, and, in order to promote the sale of meritorious works, an Art Union is held, the prizes for which are selected from the Pictures exhibited, a large sum being annually voted by the Society towards their purchase.

THOS. F. PLOWMAN,

Secretary and Editor.

4, Terrace Walk, Bath.

## Bath and West and Southern Counties Society.

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### GENERAL LAWS.

"I. The Society shall consist of a President, Vice-Presidents, Council, Treasurer, Secretary, Governors, and Members, and shall have the following objects :—

"1st. To hold meetings in the West and South of England for the exhibition of breeding stock, agricultural implements, and such other articles connected with agriculture, arts, manufactures, or commerce, as may be determined upon by the Council.

"2nd. To offer premiums for essays and reports on subjects affecting agriculture, and to publish a Journal for circulation.

"II. The West of England shall be divided into two districts, to be called the Eastern and Western, and the boundary line separating Devon from Somerset and Dorset shall be the division of such districts; and the following counties, viz., Hants, Berks, Oxford, Surrey, Sussex, and Kent, shall form a third district, to be called the Southern.

"III. The Council shall consist of a president, vice-presidents, and sixty-six other members (thirty-three of whom shall retire annually by rotation, but shall be eligible for re-election), and shall be elected by the whole body of members. Eighteen members of the Council shall be chosen from persons residing or representing property in the Eastern District, eighteen from persons residing or representing property in the Western District, eighteen from persons residing or representing property in the Southern District, and the remaining twelve may be elected from the general body of members, without reference to districts.

"IV. The election of President and Council shall take place at the annual meeting; and they shall enter into office at the conclusion of the annual meeting at which they have been chosen. The Council shall have power to nominate Vice-Presidents, and fill up such vacancies as are left after the annual meeting, and in their own body, as may from time to time occur during the interval between the annual meetings.

“V. The entire management of the Society, including the power of making bye-laws, of settling the prizes to be awarded, of nominating the committees, fixing the places of meetings, of appointing or removing the Treasurer, Secretary, and such other officers as may be required to carry on the business of this Society, shall be vested in the Council, who shall report their proceedings at the annual meeting.

“VI. The meetings for exhibitions shall be held in different towns in successive years.

“VII. A subscriber of 1*l*. and upwards annually shall be a member entitled to all the privileges of the Society; of 2*l*., a governor, and eligible for election as a vice-president; and a tenant-farmer, the rateable value of whose holding does not exceed 200*l*. a year, shall, by subscribing 10*s*. and upwards annually, also be a member of the Society, without the privilege of exhibiting at reduced fees (see Law IX.). Each member shall be liable to pay his subscription, until he shall have given notice, in writing, to the Secretary of his intention to withdraw. The subscriptions to become due and be paid in advance on the 1st of January in each year. All firms of two or more persons shall subscribe not less than 1*l*. annually.

“VIII. The payment of 10*l*. in one sum shall constitute a member for life, and of 20*l*. in one sum a governor for life; but any member, who has subscribed not less than 1*l*. annually for a period of twenty years and upwards, may become a life member on the further payment of 5*l*. in one sum; and any governor, who has subscribed not less than 2*l*. annually for the same period, may become a life governor on the further payment of 10*l*. in one sum.

“IX. To entitle a member to exhibit, he must have been a member for three months, and have paid his subscription, of not less than 1*l*. for the current year, at least one month previous to the closing of the entries. Members subscribing less than 1*l*., and non-members, will be permitted to exhibit stock, agricultural implements, or other articles, on payment of such a sum as the Council shall direct.

“X. The Annual Meetings of the Society shall be held in the months of May or June. Special General Meetings may be convened by the President on the written requisition of not less than three members of Council, all members of the Society having fourteen days' notice of the object for which they are called together. At such Annual or Special General Meetings no member of less than three months' standing, or whose subscription is in arrear, shall be entitled to a vote.

“XI. If it be proved, to the satisfaction of the Council, that any person has attempted to gain a prize in this, or any Agricultural Society, by a false Certificate, or by a misrepresentation of any kind, such person shall thereupon be excluded from again exhibiting in this Society.



“XII. All prizes shall be open for competition to the United Kingdom. But no exhibitor of stock, or person intending to compete for any of the Society’s prizes, shall be privy to the selection of judges to award the premiums.

“XIII. The proceedings of the Society, including the Prize Reports and List of Members, shall be printed annually, and every subscriber not in arrear with his subscription shall be entitled to receive one copy, free of expense, and there shall be an additional number printed for sale.

“XIV. No new general rule shall be proposed, or existing one altered or rescinded, excepting at an Annual or Special General Meeting, and then only provided a statement in writing shall have been sent to the Secretary at least twenty-one days previously, setting forth the rule to be proposed, rescinded, or altered; and in the last case the proposed alteration shall be stated.

“XV. No subject or question of a political tendency shall ever be introduced at any meeting of this Society.”

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## List of Officers.

1893-94.

### GUILDFORD MEETING.

#### PATRON.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.

#### PRESIDENT FOR 1893-94.

THE RIGHT HON. THE EARL OF ONSLOW, G.C.M.G., Clandon Park, Guildford.

#### TRUSTEES.

\*ACLAND, THE RIGHT HON. SIR THOMAS DYKE, Bart., Killerton, Exeter.  
PAGET, SIR RICHARD HORNER, Bart., M.P., Cranmore Hall, Shepton Mallet.  
LENNARD, SIR JOHN FARNABY, Bart., Wickham Court, West Wickham, Kent.

#### VICE-PRESIDENTS.

YORK, H.R.H. THE DUKE OF, K.G. . . . .	York House, London, S.W.
*ABERGAVENNY, MARQUESS OF, K.G. . . . .	Eridge Castle, Tunbridge Wells
*ACLAND, RIGHT HON. SIR T. D., Bart. . . . .	Killerton, Exeter
*AMHERST, EARL . . . . .	Montreal, Sevenoaks, Kent
BARNETT, H. . . . .	Glympton Park, Woodstock
*BATH, MARQUESS OF . . . . .	Longleat, Warminster
BELFIELD, JOHN . . . . .	Primley Hill, Torquay
*BENYON, RICHARD . . . . .	Englefield House, Reading
BRYMER, W. E., M.P. . . . .	Ilington House, Dorchester
*CARLINGFORD, LORD . . . . .	Chewton Mendip, Somerset [Devon
*CLINTON, LORD . . . . .	Heanton Satchville, Beaford, N.
*CORK AND ORRERY, EARL OF . . . . .	Marston, Frome [Cester
*COVENTRY, EARL OF . . . . .	Croome Court, Severn Stoke, Wor-
*DARNLEY, EARL OF . . . . .	Cobham Hall, Gravesend
DAW, R. R. M. . . . .	Spurbarne, Exeter
DEVONSHIRE, DUKE OF, K.G. . . . .	Chatsworth, Derbyshire
DIGBY, G. D. W. . . . .	Sherborne Castle, Sherborne
*DUCIE, EARL OF . . . . .	Tortworth, Falfield, R.S.O.
*FITZHARDINGE, LORD . . . . .	Berkely Castle, Gloucester
*FORTESCUE, EARL . . . . .	Castle Hill, South Molton
GIBBS, A. . . . .	Tyntesfield, Bristol
GORING, REV. J. . . . .	Wiston Park, Steyning
HIPPESLEY, J. H. . . . .	Ston Easton, Somerset
HULSE, SIR E., Bart. . . . .	Breamore, Salisbury
*ILCHESTER, EARL OF . . . . .	Melbury, Dorchester
*JERSEY, EARL OF . . . . .	Middleton Park, Bicester, Oxon.
KNYFTON, T. TUTTON . . . . .	Uphill, Weston-super-Mare
*LANDSOWNE, MARQUESS OF . . . . .	Bowood, Calne
LECONFIELD, LORD . . . . .	Petworth House, Sussex [Kent
LENNARD, SIR J. F., Bart. . . . .	Wickham Court, West Wickham,
*LEWELYN, SIR J. T. D., Bart. . . . .	Penllergare, Swansea
*LOPES, SIR M., Bart. . . . .	Marristow, Roborough, S. Devon

\* Those to whose names an asterisk (\*) is prefixed have filled the office of President.

VICE-PRESIDENTS—*continued.*

LOVELACE, EARL OF . . . . .	Ashley Combe, Porlock, Somerset
LOYD, LEWIS . . . . .	Monk's Orchard, Bromley, Kent
MILDMAY, SIR H. ST. JOHN, Bart. . . . .	Dogmersfield Park, Winchfield
MOORE-STEVENSON, J. C. . . . .	Winscott, Great Torrington
MORETON, LORD. . . . .	Sarsden House, Chipping Norton
*MORLEY, EARL OF . . . . .	Saltram, Plympton, Devon
MORRELL, G. HERBERT . . . . .	Headington Hill Hall, Oxford
*MOUNT-EDGCUMBE, EARL OF . . . . .	Mount-Edgcumbe, Devonport
MOYSEY, HENRY GORGES . . . . .	Bathealton Court, Wiveliscombe
MURCH, JEROM . . . . .	Cranwells, Bath
NORTHUMBERLAND, DUKE OF . . . . .	Albury Park, Guildford
PAGET, Sir R. H., Bart., M.P. . . . .	Cranmore Hall, Shepton Mallet
PINNEY, W. . . . .	Somerton
POLTIMORE, LORD . . . . .	Poltimore, Exeter [Har
PORTAL, MELVILLE . . . . .	Laverstock House, Micheldever,
RICHMOND, DUKE OF, K.G. . . . .	Goodwood Park, Chichester
SAINT GERMAN, EARL OF . . . . .	Port Elliot, Devonport
SOMERSET, DUKE OF . . . . .	Maiden Bradley, Bath
STORY-MASKELYNE, N. . . . .	Basset Down House, Swindon
STUCLEY, Sir G. S., Bart. . . . .	Moreton, Bideford, N. Devon
*TEMPLE, EARL . . . . .	Newton Park, Bath.
THYNNE, LORD HENRY . . . . .	Muntham, Worthing
*TREDGAR, LORD . . . . .	Tredgar Park, Newport, Monmouth
*TREMAYNE, JOHN . . . . .	Heligan, St. Austell
TROYTE, COL. . . . .	Huntsham Court, Bampton, Devon
WALTER, JOHN . . . . .	Bearwood, Wokingham
*WARWICK, EARL OF . . . . .	Warwick Castle
WEYMOUTH, VISCOUNT . . . . .	Widcombe House, Bath
WINCHESTER, MARQUESS OF . . . . .	Amport St. Mary's, Andover
THE LORD WARDEN OF THE STANNARIES.	
THE SURVEYOR-GENERAL OF THE DUCHY OF CORNWALL.	
THE RECEIVER-GENERAL OF THE DUCHY OF CORNWALL.	

\*.\* Those to whose names an asterisk (\*) is prefixed have filled the office of President.

**MEMBERS OF COUNCIL.****EASTERN DIVISION.**

<i>Elected in 1892:—</i>		<i>Elected in 1893:—</i>	
<i>Name.</i>	<i>Address.</i>	<i>Name.</i>	<i>Address.</i>
WAT, J. H.	Hampton Court, Leominster	DIGBY, J. K. W., M.P.	Sherborne Castle, Sherborne
THOMAS, H., M.P.	Rowford Lodge, Taunton	DUKE, THOMAS	Long Ashton Lodge, Clifton
C. R.	Hadspen, Castle Cary.	EDWARDS, C. L. F.	The Court, Axbridge, Somerset
J. St. J.	Fitzhead Court, Taunton	FARWELL, F. G.	11, Laura Place, Bath
H. B.	Chapel House, Bath	HOOD, SIR A. A.-LAND, Bart., M.P.	St. Audries, Bridgwater
GRENVILLE, J.	Chippenham	JONES, HENRY PARR	Portway House, Warminster
	Butleigh Court, Glastonbury	SANFORD, E. C. A.	Nynehead Court, Welling-ton, Somerset
	Evercreech, Bath	SKINNER, A. C.	Bishop's Lydeard, Taunton
	Herrington, Dorchester	SWEET, REV. L. E.	Bathford Vicarage, Bath

**WESTERN DIVISION.**

C. R.	Strathculm, Hele, Cul-lompton	ACLAND, C. T. D.	Killerton, Exeter
I.	Trehill, Exeter	CALMADY, V. P.	Tetcott, Holsworthy
RICHARD	Combe, Honiton	DYMOND, FRANCIS W.	Bampfylde House, Exeter
S. P.	Plympton St. Mary, South Devon	LEIB, COL. W.	Combe Head, Bampton, Devon
D.	Pratshayes, Exmouth	NAPER, COL. W. D.	Stanley Lodge, Exmouth
SIR J. BL.	Shobrooke Park, Crediton	SANDERS, E. J.	Stoke House, Exeter
SIR W. R.		SILLIFANT, A. O.	Coombe, Copplestone
	Heanton, Barnstaple	TROOD, COL. R.	Matford, Exeter
RICHARD	Rudway, Thorverton	WALBROND, SIR W. H., Bart., M.P.	New Court, Topsham, Devon
EDGELL, COL.			
R.	Cowley House, Exeter		

**SOUTHERN DIVISION.**

L. G.	Charlton House, Ludwell, Salisbury	ASHCROFT, W.	Hayes, Beckenham, Kent
A. F. M.	Bladon House, Woodstock	BOTELER, CAPT. W. J.	
C.	Wiston Park, Steyning, Sussex	CASBERD	The Elms, Taplow
J. ARTHUR	4, Savile Row, London, W.	CUBE, H. M.	Higham, Kent
G.	Wray Park, Reigate	CUNDALL, H. M.	Richmond, Surrey
D. A.	Eatons, Steyning	GILL, FREDERICK	Speenhamland, Newbury
F.	44, Great Ormond Street, Bloomsbury, London	PAIN, C.	Longstock, Stockbridge, Hants
EAD, C. F. L. S.	Barming House, Maidstone	SEYMOUR, R. A. H.	46, Earl Street, Maidstone
S. A. G.	Portsea, Hants	SUTTON, MARTIN J.	Kidmore Grange, Caversham, Oxon

**ELECTED WITHOUT REFERENCE TO DISTRICT.**

JAMES D.	Springfield House, Shepton Mallet	BEST, CAPT. J. C. (R.N.)	Plas-yn-Vivod, Llangollen
TROCK, BARON	The Hendre, Monmouth	BROWN, W. J.	Middlehill House, Box, Wilts
LYN. EVAN H.	Langford Court, Bristol	CHORLEY, W. L.	Quarnc, Dunster
G. E.	Hann Court, Upton-on-Severn	FOWLER, W. H.	Taunton
S. C. D.	Newport, Mon.	GIBBONS, GEORGE	Tunley, Bath
H. D.	Claverton Manor, Bath	TAYLOR, H. W.	Showle Court, Ledbury

**EX-OFFICIO MEMBERS.**

TREASURER	BADCOCK, HENRY JEFFRIES, Somersetshire Bank, Taunton.
CONSULTING SURVEYOR	SPACKMAN, HENRY, 6, Terrace Walk, Bath.

**COMMITTEES, 1893-94.**[The PRESIDENT is *ex-officio* Member of all Committees.]**AGRICULTURAL EDUCATION.**PAGET, Sir R. H., Bart., M.P., *Chairman.*

ACLAND, Rt. Hon. Sir T.	EDWARDS, C. L. F.	LENNARD, Sir J. F., Bart.
D., Bart.	GIBBONS, G.	LLEWELLYN, E. H.
ACLAND, C. T. D.	GORING, Rev. J.	MASKELYNE, N. STORY.
ALLEN, J. D.	HOBHOUSE, H. (M.P.)	SUTTON, M. J.
AMHERST, EARL	KNOLLYS, C. R.	

(With power to add to their number.)

**ALLOTMENT.**BEST, Capt. J. C., *Chairman.*

BOTELER, CAPT. W. J. C.	LLEWELLYN, E. H.	NEVILLE-GRENVILLE, R.
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GIBBONS, G.		

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ACLAND, C. T. D.	FARWELL, F. G.	MURCH, JEROM.
CUNDALL, H. M. (F.S.A.)	MOORE-STEVENS, J. C.	NAPER, Col. W. D.
DAW, R. R. M.	MORRELL, G. H.	WILLIAMS, E. W.

(With power to add to their number.)

**CONTRACTS AND REFRESHMENTS.**BEST, CAPT. J. C. (R.N.), *Chairman.*

BOTELER, CAPT. W. J. C.	LLEWELLYN, E. H.	NEVILLE-GRENVILLE, R.
EDWARDS, C. L. F.	NAPIER, H. B.	SANFORD, E. C. A.

**DAIRY.**ACLAND, C. T. D., *Chairman.*

ACLAND, Rt. Hon. Sir T.	GIBBONS, G.	NEVILLE-GRENVILLE, R.
D., Bart.	KNOLLYS, C. R.	PAGET, Sir R. H., Bart.
ALLEN, J. D.	LENNARD, Sir J. F., Bt.	(M.P.)
ASHCROFT, W.	MASKELYNE, N. STORY-	SANFORD, E. C. A.
EDWARDS, C. L. F.	NAPIER, H. B.	WIPPELL, R.

**DISQUALIFYING.**

THE STEWARDS OF HORSES.

THE STEWARDS OF STOCK.

THE STEWARDS OF POULTRY.

**EXPERIMENTAL.**ACLAND, Right Hon. Sir T. D., Bart., *Chairman.*

ACLAND, C. T. D.	GIBBONS, G.	MASKELYNE, N. STORY-
ALLEN, J. D.	JONES, H. P.	NAPIER, H. B.
ASHCROFT, W.	KNOLLYS, C. R.	PAGET, Sir R. H., Bart.
DYKE, T.	LENNARD, Sir J. F., Bt.	(M.P.)
DRUCE, A. F. M.	LLEWELLYN, E. H.	SUTTON, M. J.

(With power to add to their number.)

**FINANCE.**JONES, H. P., *Chairman.*

COLLINS, C. R.

MARTIN, G. E.

**IMPLEMENT REGULATIONS.**BEST, CAPT. J. C. *Chairman.*

ACLAND, C. T. D.	EDWARDS, C. L. F.	NAPIER, H. B.
BOTELER, CAPT. W. J. C.	GIBBONS, G.	NEVILLE-GRENVILLE, R.
(R.N.)	JONES, H. P.	SHELLEY, Sir J., Bt.
DYKE, T.	LLEWELLYN, E. H.	

**JUDGES' SELECTION.**

LENNARD, SIR J. F., Bart., <i>Chairman.</i>		
ALLEN, J. D.	CHORLEY, W. L.	MOORE-STEVENS, J. C.
BEST, COL. G.	DRUCE, A. F. M.	SHELLEY, SIR J., Bt.
BROWN, W. J.	GIBBONS, G.	WILLIAMS, E. W.

**PUBLICATIONS.**

ACLAND, RIGHT HON. SIR THOMAS DYKE, Bart., <i>Chairman.</i>		
ACLAND, C. T. D.	DYMOND, F. W.	MARTIN, G. E.
MASKELYNE, N. STORY-		

**RAILWAY ARRANGEMENTS.**

AMHERST, EARL	ILCHESTER, THE EARL OF	LOPES, SIR M., Bart.
CORK, THE EARL OF.	LLANGATTOCK, BARON	MORLEY, THE EARL OF;
COVENTRY, THE EARL OF.	LENNARD, SIR J. F., Bt.	SHELLEY, SIR J., Bt.
DRUCE, A. F. M.		

(With power to add to their number.)

**STOCK PRIZE-SHEET.**

LENNARD, SIR J. F., Bart., <i>Chairman.</i>		
ALLEN, J. D.	DRUCE, A. F. M.	SANFORD, E. C. A.
BEST, COL. G.	GIBBONS, G.	SHELLEY, SIR J., Bt.
BROWN, W. J.	MARKER, R.	STANFORD, A.
DANGER, T.	MOORE-STEVENS, J. C.	WILLIAMS, E. W.

**Stewards.**

<i>Arts.</i>		<i>Horses.</i>	
NAPER, Col.	CUNDALL, H. M. (F.S.A.)	WILLIAMS, E. W.	BEST, Col. G.
<i>Butter Test.</i>		<i>Horticulture.</i>	
SHELLEY, Sir J., Bart.		LEIR, Col. W. (F.R.H.S.)	
<i>Cattle, Sheep and Pigs.</i>		<i>Music.</i>	
LENNARD, Sir J. F., Bart.		NAPER, Col.	
DRUCE, A. F. M.	SHELLEY, Sir J., Bt.	<i>Poultry.</i>	
<i>Dairy.</i>		SANDERS, E. J.	
GIBBONS, G.	KNOLLYS, C. R.	<i>Shoeing.</i>	
<i>Dining Service.</i>		BEST, Col. G.	
SWEET, Rev. L. E.		<i>Works.</i>	
<i>Experiments.</i>		NAPIER, H. B.	
KNOLLYS, C. R.		<i>Yard.</i>	
<i>Field.</i>		BEST, Capt. J. C. (R.N.)	
JONES, H. P.	DYKE, T.	EDWARDS, C. L. F.	
<i>Forage.</i>		BOTELEER, Capt. W. J. C.	
SKINNER, A. C.		<i>Assistant Steward.</i>	
<i>Hops.</i>		LLEWELLYN, E. H.	
WHITEHEAD, C. (F.L.S.)			

<i>Treasurer.</i>	<i>Local Treasurer.</i>	<i>Consulting Chemist.</i>
BADGOCK, H. J.	DYMOND, F. W.	VOELCKER, Dr. J. A. (F.I.C.)
<i>Consulting Surveyor.</i>		<i>Consulting Botanist.</i>
SPACKMAN, H.		CARRUTHERS, W. (F.R.S.)
<i>Editor of 'Journal.'</i>	<i>Associate Editor.</i>	<i>Veterinary Inspector.</i>
PLOWMAN, THOS. F.	LOYD, F. J. (F.C.S.)	BROWN, Prof. G. T. (C.B.)
<i>Auditor.</i>		<i>Superintendent of Works.</i>
GOODMAN, A. (Chartered Accountant.)		ROSSITER, J.

*Secretary*—PLOWMAN, THOMAS F.

## Member's Privileges.

### EXAMINATION OF PLANTS AND SEEDS.

Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested, in applying for Examination of Plants and Seeds, to state that they do so as Members of the first-named Society.

The Council have arranged for the following rates of charge for the examination, by the Society's Consulting Botanist, of Plants and Seeds for the *bond fide* and individual information and benefit of Members of the Society (not being seedsmen). The charge for examination must be paid at the time of application, and the carriage of all parcels must be prepaid.

No.

- 1.—A report on the purity and germinating power of a sample of seed, stating the sorts and amount of any other seeds found therein . . . . . 1s.
- 2.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention . . . 1s.
- 3.—Report on any disease affecting farm crops . . . . . 1s.
- 4.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value . . . . . 5s.

*N.B.—The Consulting Botanist's Reports on Seeds are furnished to enable Members,—purchasers of seeds and corn for Agricultural or Horticultural purposes,—to test the value of what they buy, and not to be used or made available for advertising or trade purposes.*

### PURCHASE OF SEEDS.

The purchaser should obtain from the vendor, by invoice or otherwise, a proper designation of the seed he buys, with a guarantee that it contains not more than a specified amount of other seeds, and is free from ergot, or, in the case of clovers, from dodder, and of the percentage of seeds that will germinate.

The germination of cereals, green crops, clover, and timothy grass should be not less than 90 per cent.; of fox-tail not less than 60 per cent.; of other grasses not less than 70 per cent.

The Council strongly recommend that the purchase of prepared mixtures should be avoided, and that the different seeds to be sown should be purchased separately.

### INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES.

#### I. SEEDS.

In sending seed or corn for examination the utmost care must be taken to secure a fair and honest sample. In the case of grass-seeds the sample should be drawn from the centre of the sack or bag, and in all cases from the bulk delivered to the purchaser and not from the purchase sample. When bought by sample, the whole or part of that sample should also be sent.

When it is considered necessary to secure legal evidence, the sample should be taken from the bulk and placed in a sealed bag in the presence of a reliable witness who is acquainted with the identity of the bulk, and care should be taken that the purchased sample and bulk be not tampered with after delivery, or mixed or come in contact with any other sample or stock.

One ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. The exact name under which the seed has been bought should be sent with it.

*Grass-seeds should be sent at least FOUR WEEKS, and clover-seeds TWO WEEKS before they are required, and they should not be sown until the report has been received.*

#### II. PLANTS.

In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. They should be placed in a bottle, or packed in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

Parcels or letters containing seeds or plants for examination (carriage or postage prepaid) must be addressed to Mr. W. CARRUTHERS, F.R.S., 43, Central Hill, Norwood, London, S.E.

## Member's Privileges.

### ANALYSES OF MANURES, FEEDING-CAKES, WATERS, SOILS, &c.

*(Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis.)*

**Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested, in applying for Analyses, to state that they do so as Members of the first-named Society.**

The Council have fixed the following rates of Charges for Chemical Analysis to Members of the Society.

These privileges are applicable only when the Analyses are for *bonâ-fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom.

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

Land or estate agents, bailiffs, and others, when forwarding samples, are required to state the names of those members on whose behalf they apply.

Members are also allowed to send for analysis under these privileges any manures or feeding-stuffs to be used by their outgoing tenants, or which are to be given free of cost to their occupying tenants.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Members are requested, when applying for an analysis, to quote the number in the subjoined schedule under which they wish it to be made.

The fees for analysis must be sent to the Consulting Chemist at the time of application.

No.		
1.	An opinion of the purity of bone-dust or oil-cake (each sample)	2s. 6d.
2.	An analysis of sulphate or muriate of ammonia, or of nitrate of soda, together with an opinion as to whether it be worth the price charged	5s.
3.	An analysis of guano; showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, together with an opinion as to whether it be worth the price charged	10s.
4.	An analysis of mineral superphosphate of lime for soluble phosphates only, together with an opinion as to whether it be worth the price charged	5s.
5.	An analysis of superphosphate of lime, dissolved bones, &c., showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime, and ammonia, together with an opinion as to whether it be worth the price charged	10s.
6.	An analysis of bone-dust, or any other ordinary artificial manure, together with an opinion as to whether it be worth the price charged	10s.
7.	An analysis of compound artificial manures, animal products, refuse substances used for manures, &c.	from 10s. to £1
8.	An analysis of limestone, showing the proportion of lime	7s. 6d.
9.	An analysis of limestone, showing the proportion of lime and magnesia	10s.
10.	An analysis of limestone or marl, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay	10s.
11.	Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime	10s.
12.	Complete analysis of a soil	£3
13.	An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre, as well as of starch, gum, and sugar in the aggregate; and an opinion of its feeding and fattening or milk-producing properties	10s.
14.	Analysis of any vegetable product	10s.
15.	Determination of the "hardness" of a sample of water before and after boiling	5s.
16.	Analysis of water of land-drainage, and of water used for irrigation	£1
17.	Analysis of water used for domestic purposes	£1 10s.
18.	An analysis of milk (to assist Members in the management of their Dairies and Herds, <i>bonâ fide</i> for their own information and not for trade purposes, nor for use in connection with the Sale of Food and Drugs Acts)	5s.
19.	Personal consultation with the Consulting Chemist. (To prevent disappointment it is suggested that Members desiring to hold a consultation with the Consulting Chemist should write to make an appointment)	5s.
20.	Consultation by letter	5s.
21.	Consultation necessitating the writing of three or more letters	10s.

Members wishing to exercise their privileges on the above-named terms, should forward their samples for examination *by parcel, prepaid*, to the Consulting Chemist, DR. JOHN AUGUSTUS VOLCKEL, F.I.C., 22, Tudor Street, New Bridge Street, London, E.C.



## INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

**ARTIFICIAL MANURES.**—Take a large handful of the manure from three or four bags, mix the whole on a large sheet of paper, breaking down with the hand any lumps present, and fold up in tinfoil, or in oil-silk, about 3 oz. of the well-mixed sample; or place the mixed manure in a small wooden or tin box, and send it by post. If the manure be very wet and lumpy, a large boxful, weighing from 10 to 12 oz., should be sent either by post or railway.

Samples weighing less than  $\frac{1}{2}$  lb. should be sent by letter post; samples above that weight can be most cheaply forwarded by parcel post.

The parcels should be addressed: DR. J. AUGUSTUS VOELCKER, 22, TUDOR STREET, NEW BRIDGE STREET, LONDON, E.C.

**OILCAKES.**—Take a sample from the middle of the cake. To this end break a whole cake into two. Then break off a piece from the end where the two halves were joined together, and wrap it in paper, and send by parcel post. The piece should weigh at least from 10 to 12 oz. If sent by railway, one quarter or half a cake should be forwarded, carriage prepaid.

**FEEDING MEALS.**—About 3 oz. will be sufficient for analysis. Enclose the meal in a small linen bag. Send it by post.

**SOILS.**—Have a wooden box made 6 inches long and wide, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil with its subsoil 9 to 12 inches deep; trim this block or plan of the field to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up, gently turn over the box, nail on the lid, and send it by goods or parcel train to the Laboratory. The soil will then be received in the exact position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

**WATERS.**—The water, if possible, should be sent in a glass-stoppered Winchester half-gallon bottle, which is readily obtained at any chemist and druggist's shop. If Winchester bottles cannot be procured, the water may be sent in perfectly clean new stoneware spirit-jars, surrounded by wicker-work. For the determination of the degree of hardness before and after boiling, only one quart wine-bottle full of water is required.

**LIMESTONES, MARLS, &c.**—Whole pieces, weighing from 3 to 4 oz., should be sent enclosed in small linen bags, or wrapped in paper.

On forwarding samples, separate letters should be sent to the Laboratory specifying the nature of the information required, and, if possible, the object in view.

## GUIDE TO THE PURCHASE OF ARTIFICIAL MANURES AND FEEDING STUFFS.

### FEEDING CAKES.

1. *Linseed-cake* should be purchased as "Pure," and the insertion of this word on the invoice should be insisted upon. The use of such words as "Best," "Genuine," &c., should be objected to by the purchaser.

2. *Rape-cake for feeding purposes* should be guaranteed "Pure," and purchased by sample.

3. *Decorticated Cotton-cake* should be guaranteed "Pure," and purchased by sample.

4. *Undecorticated Cotton-cake* should be guaranteed "Pure," and purchased by sample.

N.B.—All feeding cakes should be purchased in good condition, and the guarantee of the vendor should be immediately checked by a fair sample (taken out of the middle of the cake) being at once sent for examination to a competent analytical chemist. The remainder of the cake from which the sample sent for examination had been taken should be sealed up in the presence of a witness, and retained by the purchaser for reference in case of dispute.

### ARTIFICIAL MANURES.

1. *Raw or Green Bones or Bone-dust* should be purchased as "Pure" Raw Bones guaranteed to contain from 45 to 48 per cent. of tribasic phosphate of lime, and to yield not less than 4 per cent. of ammonia.

2. *Boiled Bones* should be purchased as "Pure" Boiled Bones guaranteed to contain from 55 to 60 per cent. of tribasic phosphate of lime, and to yield not less than 1 per cent. of ammonia.

3. *Dissolved Bones* are made of various qualities, and are sold at various prices per ton; therefore the quality should be guaranteed under the heads of *soluble* phosphate of lime, *insoluble* phosphate of lime, and nitrogen, or its equivalent of ammonia. The purchaser should also stipulate for an allowance for each unit per cent. which the dissolved bones should be found on analysis to contain less than the guaranteed percentages of the three substances already mentioned.

4. *Mineral Superphosphates* should be guaranteed to be delivered in a sufficiently dry and powdery condition, and to contain a certain percentage of *soluble* phosphate of lime, at a certain price per unit per cent., no value to be attached to *insoluble* phosphates.

5. *Compound Artificial Manures* should be purchased in the same manner and with the same guarantees as Dissolved Bones.

6. *Nitrate of Soda* should be guaranteed by the vendor to contain 95 per cent. of pure nitrate.

7. *Sulphate of Ammonia* should be guaranteed by the vendor to contain not less than 24 per cent. of ammonia.

8. *Peruvian Guano* should be sold under that name, and guaranteed to be in a dry and friable condition, and to contain a certain percentage of ammonia.

N.B.—Artificial manures should be guaranteed to be delivered in a sufficiently dry and powdery condition to admit of distribution by the drill. A sample of analysis should be taken, not later than three days after delivery, by emptying several bags, mixing the contents together, and filling two tins holding about half a pound each, in the presence of a witness. Both the tins should be sealed, one kept by the purchaser for reference in case of dispute, and the other forwarded to a competent analytical chemist for examination.

**GUILDFORD MEETING,**

MAY 30 AND 31, AND JUNE 1, 2, AND 4, 1894.

**MONEY PRIZES.**

	£	s.	d.		Page
HORSES .. .. .	536	0	0	..	lxxvii
CATTLE .. .. .	1,221	10	0	..	lxxviii
SHEEP .. .. .	525	0	0	..	lxxx
PIGS .. .. .	260	0	0	..	lxxxi
CORN .. .. .	30	0	0	..	lxxxii
HOPS .. .. .	16	0	0	..	lxxxiii
CHEESE .. .. .	145	0	0	..	lxxxiv
BUTTER AND CREAM .. .. .	61	0	0	..	lxxxv
BUTTER-MAKING .. .. .	62	10	0	..	lxxxvi
HORSE-SHOEING .. .. .	22	0	0	..	lxxxvii
SHEEP-SHEARING .. .. .	10	0	0	..	lxxxviii
POULTRY .. .. .	190	10	0	..	xciii
Total .. .. .	£3,079	10	0		

The above Prizes are given in the following proportions:—

	£	s.	d.
By the Society .. .. .	2,876	0	0
„ Guildford Local Committee .. .. .	174	0	0
„ English Jersey Cattle Society .. .. .	9	0	0
„ Kerry and Dexter Cattle Society .. .. .	10	10	0
„ Shropshire Sheep Breeders' Association .. .. .	10	0	0
	£3,079	10	0

**MEDALS AND PLATE.**

In addition to the above Prizes, there are offered:—

A GOLD MEDAL, or BRONZE MEDAL and 5*l.*, in the Hunter Classes, by the Hunters' Improvement Society.

A GOLD, a SILVER, and a BRONZE MEDAL, in the Jersey Butter Test Class, by the English Jersey Cattle Society.

Two SILVER CUPS, in the Guernsey Classes, by the English Guernsey Cattle Society.

A GOLD, a SILVER, and a BRONZE MEDAL, in the Butter-making Classes, by the Society.

A SILVER MEDAL, in the Butter-making Classes, by the Surrey County Council.

## PRIZES.

*Except where otherwise stated, all Prizes are open without restriction to County.*

<b>HORSES.</b>		First Prize.	Second Prize.	Third Prize.
<i>An Animal cannot be entered in more than one Class.</i>		£	£	£
CLASS	<b>SHIRE.</b>			
1.—STALLION, foaled before 1892 . . . . .		20	10	5
2.—STALLION, foaled in 1892 . . . . .		15	10	5
3.—MARE and FOAL, or in-FOAL . . . . .		20	10	5
4.—FILLY, foaled in 1891 . . . . .		10	5	3
5.—FILLY, foaled in 1892 . . . . .		10	5	3
<b>ANY AGRICULTURAL BREED EXCEPT SHIRE.</b>				
6.—STALLION, foaled before 1892 . . . . .		20	10	5
7.—STALLION, foaled in 1892 . . . . .		15	10	5
8.—MARE and FOAL, or in-FOAL . . . . .		20	10	5
9.—FILLY, foaled in 1891 . . . . .		10	5	3
10.—Filly, foaled in 1892 . . . . .		10	5	3
<b>ANY BREED.</b>				
*11.— <i>Gelding of any age</i> . . . . .		10	5	3
*12.— <i>Cart Mare or Filly, of any age</i> . . . . .		10	5	3
<b>HUNTERS.</b>				
13.—MARE or GELDING, foaled in 1890 . . . . .		20	10	
14.—FILLY or GELDING, foaled in 1891 . . . . .		15	5	3
15.—FILLY or GELDING, foaled in 1892 . . . . .		15	5	3
16.—FILLY or COLT, foaled in 1893 . . . . .		15	5	3
17.—MARE and FOAL, or in-FOAL . . . . .		25	10	5
The Hunters' Improvement Society offer a Gold Medal, or a Bronze Medal, and £5, for the best HUNTER BROOD MARE in Class 17, in-Foal to, or with Foal at foot by, a Thorough-bred Horse or Registered Hunter Sire, under Condition 32a, stated on p. lxxxix.				
<b>HACKS.</b>				
18.—MARE or GELDING, over 14 hands . . . . .		10	5	3
19.—MARE or GELDING, not over 14 hands . . . . .		10	5	3
<b>PONIES.</b>				
20.—MARE or GELDING, not over 13 hands . . . . .		7	3	2
<b>HARNESS.</b>				
21.—MARE or GELDING, over 14 hands and not over 15.2 . . . . .		10	5	3
22.—MARE or GELDING, not over 14 hands . . . . .		10	5	3

\* The Prizes printed in *italics* are offered by the Guildford Local Committee, and are restricted to Competitors living within 20 miles of Guildford, or in the administrative County of Surrey.

CATTLE.		First Prize.	Second Prize.	Third Prize.
<i>An Animal cannot be entered in more than one Class.</i>		£	£	£
CLASS	DEVON.			
23.—BULL, calved in 1890 or 1891 . . . . .		15	10	5
24.—BULL, calved in 1892 . . . . .		15	10	5
25.—BULL, calved in 1893 . . . . .		15	10	3
26.—COW, in-Milk or in-Calf, calved before 1891 . . . . .		15	10	3
27.—HEIFER, in-Milk or in-Calf, calved in 1891 . . . . .		15	10	3
28.—HEIFER, calved in 1892 . . . . .		10	5	3
29.—HEIFER, calved in 1893 . . . . .		10	5	3
SHORTHORN.				
30.—BULL, calved in 1890 or 1891 . . . . .		15	10	5
31.—BULL, calved in 1892 . . . . .		15	10	5
32.—BULL, calved in 1893 . . . . .		15	10	3
33.—COW in-Milk or in-Calf, calved before 1891 . . . . .		15	10	3
34.—HEIFER, in-Milk or in-Calf, calved in 1891 . . . . .		15	10	3
35.—HEIFER, calved in 1892 . . . . .		10	5	3
36.—HEIFER, calved in 1893 . . . . .		10	5	3
HEREFORD.				
37.—BULL, calved in 1890 or 1891 . . . . .		15	10	5
38.—BULL, calved in 1892 . . . . .		15	10	5
39.—BULL, calved in 1893 . . . . .		15	10	3
40.—COW, in-Milk or in-Calf, calved before 1891 . . . . .		15	10	3
41.—HEIFER, in-Milk or in-Calf, calved in 1891 . . . . .		15	10	3
42.—HEIFER, calved in 1892 . . . . .		10	5	3
43.—HEIFER, calved in 1893 . . . . .		10	5	3
SUSSEX.				
44.—BULL, calved in 1890 or 1891 . . . . .		15	10	5
45.—BULL, calved in 1892 . . . . .		15	10	5
46.—BULL, calved in 1893 . . . . .		15	10	3
47.—COW, in-Milk or in-Calf, calved before 1891 . . . . .		15	10	3
48.—HEIFER, in-Milk or in-Calf, calved in 1891 . . . . .		15	10	3
49.—HEIFER, calved in 1892 . . . . .		10	5	3
50.—HEIFER, calved in 1893 . . . . .		10	5	3
JERSEY.				
51.—BULL, calved in 1890 or 1891 . . . . .		15	10	5
52.—BULL, calved in 1892 . . . . .		15	10	5
53.—BULL, calved in 1893 . . . . .		15	10	3
54.—COW, in-Milk or in-Calf, calved before 1891 . . . . .		15	10	3
55.—HEIFER, in-Milk or in-Calf, calved in 1891 . . . . .		15	10	3
56.—HEIFER, calved in 1892 . . . . .		10	5	3
57.—HEIFER, calved in 1893 . . . . .		10	5	3
(Offered by the English Jersey Cattle Society.)				
Cow or Heifer in the Jersey Classes, eligible for the English Jersey Herd Book, yielding the largest quantity of Butter by the practical Test of the Separator and Churn.				
1st Prize, Gold Medal and . . . . .		3		
2nd „ Silver Medal and . . . . .			3	
3rd „ Bronze Medal and . . . . .				3

CATTLE— <i>continued.</i>		First Prize.	Second Prize.	Third Prize.
CLASS	GUERNSEY.	£ s.	£	£
58.—	BULL, calved in 1890 or 1891 . . . . .	15	10	5
59.—	BULL, calved in 1892 . . . . .	15	10	5
60.—	BULL, calved in 1893 . . . . .	15	10	3
61.—	Cow, in-Milk or in-Calf, calved before 1891 . . . . .	15	10	3
62.—	HEIFER, in-Milk or in-Calf, calved in 1891 . . . . .	15	10	3
63.—	HEIFER, calved in 1892 . . . . .	10	5	3
64.—	HEIFER, calved in 1893 . . . . .	10	5	3
<b>SPECIAL PRIZES.</b>				
(Offered by the English Guernsey Cattle Society.)				
Best Pair of Guernsey Cows in Class 61, Silver Cup, value . . . . .		5		
Best Pair of Guernsey Heifers in Classes 62, 63, and 64, Silver Cup, value . . . . .		5		
<b>ABERDEEN-ANGUS.</b>				
65.—	BULL, calved in 1891, 1892, or 1893 . . . . .	10	5	2
66.—	Cow or HEIFER, in-Milk or in-Calf, of any age . . . . .	10	5	2
<b>KERRY.</b>				
67.—	BULL, calved in 1891, 1892, or 1893 . . . . .	10	5	2
68.—	Cow or HEIFER, in-Milk or in-Calf, of any age . . . . .	10	5	2
<b>SPECIAL PRIZE.</b>				
(Offered by the Kerry and Dexter Cattle Society.)				
Best Animal in Class 67 or 68, whose Sire and Dam are entered in the Herd Book . . . . .		5 5		
<b>DEXTER KERRY.</b>				
69.—	BULL, calved in 1891, 1892, or 1893 . . . . .	10	5	2
70.—	Cow or HEIFER, in-Milk or in-Calf, of any age . . . . .	10	5	2
<b>SPECIAL PRIZE.</b>				
(Offered by the Kerry and Dexter Cattle Society.)				
Best Animal in Class 69 or 70 whose Sire and Dam are entered in the Herd Book . . . . .		5 5		
<b>ANY BREED.</b>				
71.—	* Cow, yielding the largest quantity of Butter by the practical test of the Separator and Churn . . . . .	10	7	3

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S H E E P.		First Prize.	Second Prize.	Third Prize.	Fourth Prize.
<i>An Animal cannot be entered in more than one Class.</i>		£	£	£	£
CLASS	LEICESTER.				
72.—Shearling RAM . . . . .		10	5	2	
73.—Pair of RAM LAMBS, dropped in 1894 . . . . .		10	5	2	
74.—Pen of three Shearling EWES . . . . .		10	5	2	
COTSWOLD.					
75.—Shearling RAM . . . . .		10	5	2	
76.—Pair of RAM LAMBS, dropped in 1894 . . . . .		10	5	2	
77.—Pen of three Shearling EWES . . . . .		10	5	2	
DEVON LONG-WOOL.					
78.—Shearling RAM . . . . .		10	5	2	
79.—Pair of RAM LAMBS, dropped in 1894 . . . . .		10	5	2	
80.—Pen of three Shearling EWES . . . . .		10	5	2	
ROMNEY MARSH OR KENT.					
81.—Shearling RAM . . . . .		10	5	2	
82.—Pair of RAM LAMBS, dropped in 1894 . . . . .		10	5	2	
83.—Pen of three Shearling EWES . . . . .		10	5	2	
SOUTHDOWN.					
84.—Shearling RAM . . . . .		10	5	2	
85.—Pair of RAM LAMBS, dropped in 1894 . . . . .		10	5	2	
86.—* <i>Pen of Three Ewes, of any age, having each brought up a Lamb in 1894 . . . . .</i>		10	5		
87.—Pen of three Shearling EWES . . . . .		10	5	2	
88.—* <i>Pen of Three Ewe Lambs, bred by Exhibitor . . . . .</i>		10	5		
HAMPSHIRE DOWN.					
89.—Shearling RAM . . . . .		10	5	2	
90.—Pair of RAM LAMBS, dropped in 1894 . . . . .		10	5	2	
91.—Pen of three Shearling EWES . . . . .		10	5	2	
SHROPSHIRE.					
92.—Shearling RAM . . . . .		10	5		
93.—Pair of RAM LAMBS, dropped in 1894 . . . . .		10	5	2	
94.—Pen of three Shearling EWES . . . . .		10	5	3	2
The 3rd and 4th Prizes in Classes 92 and 94 are offered by the Shropshire Sheep Breeders' Association.					

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<b>SHEEP—continued.</b>			
	First Prize.	Second Prize.	Third Prize.
<b>OXFORD DOWN.</b>			
	£	£	£
—Shearling RAM . . . . .	10	5	2
—Pair of RAM LAMBS, dropped in 1894 . . . .	10	5	2
—Pen of three Shearling EWES . . . . .	10	5	2
<b>SOMERSET AND DORSET HORN.</b>			
—Shearling RAM . . . . .	10	5	2
—Pair of RAM LAMBS, dropped after Dec. 1st, 1893 . .	10	5	2
—Pen of three Shearling EWES . . . . .	10	5	2
<b>MOUNTAIN.</b>			
—Two Shear or Shearling RAMS . . . . .	10	5	2
—Pen of three Shearling EWES . . . . .	10	5	2
<b>P I G S.</b>			
<i>Animal cannot be entered in more than one Class.</i>			
<b>BERKSHIRE.</b>			
—BOAR, farrowed in 1891 or 1892 . . . . .	7	3	2
—BOAR, farrowed in 1893 . . . . .	7	3	2
—Pair of Breeding BOARS, farrowed in 1894 . . . .	5	2	1
—Breeding Sow, farrowed before 1894 . . . . .	7	3	2
—Pair of Breeding Sows, farrowed in 1894 . . . .	5	2	1
<b>LARGE WHITE.</b>			
—BOAR, farrowed in 1891 or 1892 . . . . .	7	3	2
—BOAR, farrowed in 1893 . . . . .	7	3	2
—Pair of Breeding BOARS, farrowed in 1894 . . . .	5	2	1
—Breeding Sow, farrowed before 1894 . . . . .	7	3	2
—Pair of Breeding Sows, farrowed in 1894 . . . .	5	2	1
<b>MIDDLE WHITE.</b>			
—BOAR, farrowed in 1891 or 1892 . . . . .	7	3	2
—BOAR, farrowed in 1893 . . . . .	7	3	2
—Pair of Breeding BOARS, farrowed in 1894 . . . .	5	2	1
—Breeding Sow, farrowed before 1894 . . . . .	7	3	2
—Pair of Breeding Sows, farrowed in 1894 . . . .	5	2	1
<b>SMALL WHITE or SMALL BLACK.</b>			
—BOAR, farrowed in 1891 or 1892 . . . . .	7	3	2
—BOAR, farrowed in 1893 . . . . .	7	3	2
—Pair of Breeding BOARS, farrowed in 1894 . . . .	5	2	1
—Breeding Sow, farrowed before 1894 . . . . .	7	3	2
—Pair of Breeding Sows, farrowed in 1894 . . . .	5	2	1
L. IV.—F. S.			



PIGS— <i>continued</i> .		First Prize.	Second Prize.	Third Prize.	Fourth Prize.
CLASS	TAMWORTH.	£	£	£	£
123.—	BOAR, farrowed in 1891 or 1892 . . .	7	3	2	
124.—	BOAR, farrowed in 1893 . . .	7	3	2	
125.—	Pair of Breeding BOARS, farrowed in 1894	5	2	1	
126.—	Breeding Sow, farrowed before 1894 . .	7	3	2	
127.—	Pair of Breeding Sows, farrowed in 1894 . . . . .	5	2	1	
PRODUCE.					
CORN.					
*128.—	Four Bushels of Chidham Wheat . .	3	2		
*129.—	" " White Wheat, not being Chidham or Talavera	3	2		
*130.—	" " Red Wheat . . .	3	2		
*131.—	" " Malting Barley . . .	3	2		
*132.—	" " White Oats . . .	3	2		
*133.—	" " Black Oats . . .	3	2		
The Corn must be English and grown in 1893 by the Exhibitor, and must be shown in unmarked sacks.					
HOPS.					
*134.—	Pocket of English Goldings, grown by Exhibitor	5	3		
*135.—	Pocket of any English variety, except Goldings, grown by Exhibitor . .	5	3		
CHEESE.					
136.—	Four CHEESES (the total weight being not less than 224 lbs.) made in 1893	20	10	4	2
137.—	Four CHEESES (the total weight being not less than 120 lbs.) made in 1894	10	5	3	1
138.—	Ten Loaf or other Truckle CHEESES, made in 1894 . . . . .	5	3	2	1
139.—	Five Cream or other Soft CHEESES . .	3	2	1	
140.—	Four Caerphilly CHEESES, made in 1894	3	2	1	
141.—	Four Cheddar CHEESES (the total weight being not less than 200 lbs.), made in 1893, by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools . . . . .	15	8	6	4

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CHEESE— <i>continued.</i>		First Prize.	Second Prize.	Third Prize.	Fourth Prize.
CLASS		£	£	£	£
142.—	Four Cheddar CHEESES (the total weight being not less than 120 lbs.), made in 1894, by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools . . . . .	8	4	3	2
143.—	Four CHEESES, made in 1894, of any variety not eligible for any of the preceding Classes . . . . .	8	4	3	2

### BUTTER AND CREAM.

144.—	3 lbs. of Fresh (or very slightly salted) BUTTER, in pound plain rolls or brick-shapes, made of cream from Cows other than Channel Island Breeds . . . . .	5	3	2	1
145.—	3 lbs. of Fresh (or very slightly salted) BUTTER, in pound plain rolls or brick-shapes, made of cream from Cows of Channel Island Breeds only . . . . .	5	3	2	1
146.—	3 lbs. of Fresh (or very slightly salted) BUTTER, in pound plain rolls or brick-shapes, made by a Student who has attended a course of instruction at any of the Society's Butter Schools . . . . .	5	3	2	1
The Prizes in Class 147 are offered by the Guildford Local Committee.					
147.—	3 lbs. of Fresh (or very slightly salted) Butter, in pound plain rolls or brick-shapes, made by a Student who has attended a course of instruction at any of the Society's or County Council Butter Schools held in Surrey since January 1, 1891 . . . . .	5	3	2	1
148.—	12 lbs. of Salted BUTTER, in a jar or crock, to be delivered, addressed to the Secretary at Messrs. Bowyer & Baker's, 11, North Street, Guildford, four weeks before the Show . . . . .	5	3	2	1
149.—	4 half-pounds of Clotted or Devonshire CREAM, packed either in tins or earthen jars . . . . .	3	2	1	

BUTTER-MAKING.		First Prize.	Second Prize.	Third Prize.	Fourth Prize.	Fifth Prize.
		£ s.	£ s.	£ s.	£ s.	£ s.
(To take place in the Working Dairy in the Showyard. Not open to Makers or Vendors of Churns or their Assistants, or to any previous winner of the Society's Champion Gold Medal.)						
These Prizes will be awarded for the best and largest quantity of Butter made from a given quantity of Cream in the cleanest and most approved method.						
CLASS						
150.—On the 1st day of the Show, open only to Students who have attended a course of instruction at any of the Society's Butter Schools.		5 0	3 0	2 0	1 0	0 10
151.—On the 2nd day of the Show, open to any woman without restriction as to School.		5 0	3 0	2 0	1 0	0 10
152.—On the 3rd day of the Show, open to any man or woman, except the winner of the 1st Prize in Class 151.		5 0	3 0	2 0	1 0	0 10
153.—On the 4th day of the Show, open to any man or woman except the winners of the 1st Prizes in Classes 151 and 152.		5 0	3 0	2 0	1 0	0 10
The Prizes in Class 154 are offered by the Guildford Local Committee.						
154.—On the 4th day of the Show, open only to Students who have attended a course of instruction at any of the Society's or County Council Butter Schools held in Surrey since January 1, 1891.		5 0	3 0	2 0		
155.—On the 5th day of the Show, open to any dairymaid working for wages not exceeding £20 a year.		3 0	2 0	1 0	0 10	
CHAMPION PRIZES.						
On the 5th day of the Show the Winners of Prizes in Classes 150, 151, 152, 153, 154 and 155 will compete for:—						
1st Prize—A Gold Medal and the Society's Certificate						
2nd Prize—A Silver Medal and the Society's Certificate.						
3rd Prize—A Bronze Medal and the Society's Certificate.						
A Silver Medal is also offered by the Surrey County Council to the best Competitor in the Championship Competition who has attended a course of instruction at any of the Surrey County Council Butter Schools since January 1, 1891.						

HORSE-SHOEING.		First Prize.	Second Prize.	Third Prize.	Fourth Prize.
CLASS		£ s.	£ s.	£ s.	£ s.
156.—Best Shoeing of a NAG HORSE by a Smith in the Showyard on the 3rd day of Show . . . . .		5 0	3 0	2 0	1 0
(Offered by the Guildford Local Committee.)					
157.—Best Shoeing of a CART HORSE, on the 4th day of the Show. . . . .		5 0	3 0	2 0	1 0
(There is no restriction as to County in either of the Shoeing Classes.)					
A Pair of Shoeing Models and a Copy of Miles's 'Treatise on Shoeing' will be pre- sented to each winner of a Prize.					
The Registration Committee of the Farriers' Company will admit all the Winners of Prizes and Commendations in these Com- petitions to the Official Register <i>free of</i> <i>charge</i> , on their satisfying the Judges that they have a fair knowledge of the struc- ture of the horse's foot, and on the necessary application being made to the Company in the prescribed form.					
SHEEP-SHEARING.					
*158.— <i>Best Shearing of Two Sheep on the 4th day of the Show by a Competitor who has lived in the radius men- tioned for at least three months prior to the opening day of the 1894 Show</i>		4 0	3 0	2 0	1 0

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## CONDITIONS AND REGULATIONS.

### GENERAL.

#### ENTRIES.

1. The following are the Entry Fees, which must be paid when the Entries are made.

		Members.	Non-Members.
Horses (including Horse Box) .. .. for each Entry	10s.	..	20s.
Cattle, Sheep and Pigs .. .. do.	5s.	..	15s.
Cattle Butter Test Prizes .. .. do.	21s.	..	21s.
Cheese, Class 136 .. .. do.	10s.	..	20s.
Do. Classes 137, 138, 139, 140 and 143 .. .. do.	5s.	..	10s.
Do. Classes 141 and 142 .. .. do.	5s.	..	5s.
Corn, Hops, Butter and Cream .. .. do.	} 2s. 6d.	..	5s.
Butter-making Classes 150 to 154 .. .. do.			
Horse-Shoeing and Sheep-Shearing .. .. do.			
Butter-making, Class 155 .. .. do.	2s. 6d.	..	2s. 6d.

There is no limitation as to the number of Entries in a Class which an Exhibitor may make, except in the Dairy Produce Classes. (*See Reg. 50.*)

Entries should reach the Secretary on or before April 12; after that date and up to April 19, Entries will only be received *on payment of double fees* in each case.

2. The privilege of entering at Members' Fees is limited to Members of the Society elected on or before January 30, 1894, and subscribing not less than 1*l.* annually.

3. Where a Prize is offered for a *pair* or *pen* of animals, Single Entry-fees only are payable for each *pair* or *pen*, and only one Entry-form must be used.

4. All Entries must be made on the printed forms to be obtained of the Secretary (THOS. F. PLOWMAN, 4, Terrace Walk, Bath), and in applying for Forms Exhibitors are requested to state how many Entries they wish to make of either Horses, Cattle, Sheep, or Pigs, as each Stock Entry must be made on a separate Form.

5. All Entry-forms must be signed by the Exhibitor or his Agent. Exhibitors are requested to carefully examine the List of Prizes and Conditions, as the Society cannot be responsible for any errors made by Exhibitors in their Entry-forms. An Exhibitor omitting to give information asked for on the Entry-form, with regard to the age, name, colour, sire, dam, &c., of an Animal, will be liable to have his Entry disqualified.

6. Unless otherwise stated, an Animal or Article cannot be entered in more than one Class.

7. All Animals or Articles exhibited must be *bonâ fide* the property of the Exhibitor at and from the time of Entry.

#### SHOWYARD.

8. The Yard will be open for the reception of Horses, Cattle, Sheep, and Pigs, on Monday and Tuesday, May 28 and 29, from 7 A.M. to 6 P.M. Horses will also be received from 6 to 8 o'clock on the morning of the first day of Show, but all other Stock Entries must be in the Yard the previous day. (*See Regulations 48 and 49 for Dairy Produce.*) Labels will be sent by the Secretary, and must be securely affixed to the head of each Animal, or, in the case of other Exhibits, to the receptacle containing them.

9. All Exhibits and all persons in charge of the same, will be subject to the Orders, Regulations, and Rules of the Society.

10. All Exhibits, except Horses (see Conditions 27 and 28), must remain in the place allotted to them in the Showyard until 6 P.M. on the last day of Show.

11. No Animal can be permitted to be removed from its place without leave from the Steward of the Department, or can leave the Yard till the metal label denoting its number is given up to the Gatekeeper.

12. The Society, its Officers, and Servants, will not be liable for any errors or mistakes that may happen in placing or penning the Stock or Articles to be exhibited, but the Servants in charge of the same must see that they are placed or penned according to their Entries.

13. All Servants in charge of Stock must be in attendance each day during the Show at least a quarter of an hour before the time appointed for parading the animals in the Show-rings, and must take their animals into the ring when desired by the Stewards. Any infringement of this or any other rule, or neglecting to obey the orders of the Stewards, will render the Exhibitor liable to a fine of 1*l.*, and to the forfeiture of any Prize he may be entitled to.

14. The Society will not, in any case, or under any circumstances, hold itself responsible for any loss, damage, misdelivery, illness or accident that may occur *through or to* any Exhibit; and it shall be a condition of entry that each Exhibitor shall hold the Society harmless, and indemnify it against any legal proceedings arising from any of the above-named circumstances.

15. Hay, straw, and green food will be delivered to the servants of Exhibitors free of expense at the Forage Stores in the Showyard, and they must take it to their respective Animals. Servants must apply at the Forage Stores for their Forage Tickets after they have brought their Animals into the Yard.

NOTE.—For the convenience of Exhibitors wishing to sell their Animals, a Register will be kept at the Secretary's Office, in which they may enter the prices.

#### DISQUALIFICATIONS.

16. No Animal which has been exhibited as Fat Stock at any Show shall be eligible to compete for the Prizes offered in this Prize Sheet.

17. No Animal which has taken a First Prize at any Meeting of this Society can compete again in the corresponding Class.

18. An Animal having any unsoundness likely to be transmitted to its progeny, shall be disqualified thereby from receiving any Prize offered by or through the Society.

19. If any wilful mis-statement, or misrepresentation, be proved to have been made by an Exhibitor, either in an Entry-form or otherwise, in connection with this or any Agricultural Society, the Council shall have power to withhold any Prize awarded to him, and to disqualify him from exhibiting at the Society's future Shows. (See also Regulation 5.)

#### PENALTIES.

20. As the non-exhibition of Animals entered for the Show causes unnecessary preparations and expense, and disarranges the Showyard, any person entering Stock, and failing to exhibit the same shall pay a penalty of 10*s.* for each Entry, unless a Certificate, under the hand of the Exhibitor or his authorised agent, be lodged with the Secretary of the Society, before day of Exhibition, certifying that such non-exhibition is caused either. —

(1) the death of the animal or animals; or (2) contagious or infectious disease (confirmed by the explanatory Certificate of a Veterinary Surgeon); or (3) by its becoming ineligible for the Class in which it has been entered. Such fines to be recoverable as debts to the Society, and, until payment, to debar all persons owing them from exhibiting at any future meeting of the Society.

21. Every Exhibitor will be required to undertake to forfeit and pay to the Society the sum of 20*l.*, as and for liquidated damages, if any Animal which he exhibits be to his knowledge suffering from any contagious or infectious disease, and the Stewards are empowered to prevent the entry of any diseased Animal into the Yard, or to have it removed therefrom, if they should consider it desirable.

22. Stock Exhibitors will receive Admission Tickets for the Show for themselves and the Servants required to take charge of their Animals, and Exhibitors will be held responsible for their proper use. If a Ticket is transferred or otherwise improperly used it will be cancelled, and the Exhibitor will be required to pay a fine of 1*l.* Servants in charge of Stock at night must, if they leave the Yard, return before 10 P.M., or they will not be admitted.

#### AWARDS.

23. In all cases where Prizes are awarded *conditionally*, they will be withheld until the Exhibitor shall have proved to the satisfaction of the Council that the conditions have been complied with.

24. Except under a special recommendation from the Judges, no Second Prize will be given in any of the Classes unless there are three entries, and no Third Prize unless there are six entries. No Prize additional to those advertised by the Society will be given in any Class, except on the written recommendation of the Judges (which shall state the special reasons for the Prize) and the Steward of the Class.

25. The Certificate of the Veterinary Inspector, whether as to age or soundness, shall be required only in cases where the Judges are in doubt, or where a protest shall be delivered to the Secretary within the time prescribed by Condition No. 26. The decision of the Inspector in such cases shall be final and conclusive; and in case it shall be against the Animal to which a Prize has been awarded, such Animal shall be disqualified from receiving such Prize.

#### PROTESTS.

26. Any protest must be lodged with the Secretary in the handwriting of an Exhibitor, or that of his representative, before 6 P.M. on the first day of the Exhibition, and no protest will be accepted without a deposit of 3*l.*, which sum will be forfeited at the discretion of the Stewards unless the protest is substantiated. Protests will be considered by the Disqualifying Committee, whose decision shall be final and conclusive.

#### APPLYING TO CERTAIN CLASSES ONLY.

##### HORSES.

27. Horses can be removed from the Yard at night on deposit by the Exhibitor of 3*l.* at the Finance Office, which sum will be forfeited if the Horse does not return at 8 A.M. each day during the Exhibition.

28. The Stallions in Classes 1, 2, 6, and 7, are not required to remain in the Yard longer than 6 o'clock in the evening of the third day of the Show.

29. Exhibitors must provide saddles for Horses in Classes 13, 18, 19, and 20, as they are to be ridden; and vehicles and harness for those in Classes 21 and 22, which are to be driven.

30. No Horse, unless a Foal, will be admitted into the ring without a proper bit.

31. The Prizes for Stallions in Classes 1 and 6 will be withheld until a Certificate from the owner is delivered to the Secretary that the Horse has served at least 20 Mares during the current season.

32. In Classes 3, 8, and 17, Mares shall be exhibited with their own foals at foot, or shall hereafter be certified to have produced a living Foal before the 1st of August of the year of the Show.

32A. The following special conditions apply only to the Prize offered by the Hunters' Improvement Society, viz. :—1. "Mares which have previously been awarded the Society's Medal, and Mares which have previously won Hunters' Improvement Society's Premiums as Brood Mares shall be ineligible for this Medal. 2. In the event of the Medal being awarded to a Mare entered as 'in foal to a Thoroughbred Horse or Registered Hunter Sire,' the Hunters' Improvement Society will not forward the Medal till a Certificate of foaling has been lodged with their Secretary. 3. If any of the Prize Mares are disqualified owing to their previous win of the Hunters' Improvement Society's Medal or Premiums, it shall then be awarded to the next in order of award, provided she takes one of the Prizes or the First Reserve."

#### CATTLE.

33. All bulls must have a ring or clamp attached to the nose, and in the aged Classes must be provided with a strong chain. All cattle must be properly secured to the satisfaction of the Officers of the Society, on being brought to the gate of the Yard, or they will not be admitted.

34. All Cattle will be required to be paraded in the ring at least once a day at the discretion of the Stewards.

35. No Bull above 2 years old will be eligible to receive a Prize until certified to have served not less than six different Cows (or Heifers), previous to June 1st, 1894, and it must be the sire of live calves dropped in the year 1894.

36. No Cow will be eligible to receive a Prize until certified to have had a living Calf within the twelve months preceding the date of Show.

37. In the Classes for Heifers "in-Milk or in-Calf," no Heifer entered as in-Calf will be eligible to receive a Prize until certified to have produced a living Calf before March 1st, 1895, or that the Calf, if dead, was born at full time before that date.

38. Every Cow or Heifer in-Milk shall be milked dry in the Showyard at 6 P.M. on the evening preceding the day of judging, in the presence of an officer of the Society appointed for the purpose.

39. Any Animal in the Cattle Classes found to be artificially coloured will be disqualified.

40. Any person selling Milk in the Yard, except in the place appointed by the Stewards, will be fined 5s. for each infringement of this Regulation.

#### SHEEP.

41. All Sheep (with the exception of the Welsh Mountain Breed) over one year old must have been really and fairly shorn bare on or after the 1st of April in the year of the Exhibition. Inspectors will be appointed by the Council to examine Sheep, on their admission to the Showyard, with



instructions to report to the Stewards any cases in which this has not been done.

42. Each pen of Ewes must be of the same Flock. No Exhibitor shall enter in the Leicester and any other Long-wool Classes from the same Flock.

#### Pigs.

43. The Pair of Pigs in each pen must be of the same litter.

44. All Sows farrowed before 1894 shall be certified to have had a litter of live Pigs within six months preceding the first day of exhibition, or to be in-Pig at the time of entering, so as to produce a litter of Pigs, farrowed at their proper time, before the 1st of September following. In the case of in-Pig Sows the Prize will be withheld until the Exhibitor shall have furnished the Secretary with a certificate of farrowing as above.

45. All Pigs exhibited with a Sow shall be her own produce, of the same litter, and not exceeding two months old at the time of the Show.

46. No Sow above 18 months old that has not produced a litter of live Pigs shall be eligible to compete in any of the Classes.

47. Any animal in the Pig Classes found to be artificially coloured will be disqualified.

#### CHEESE, BUTTER AND CREAM.

48. Cheese will be received in the Yard on Monday, May 28, from 7 A.M. to 6 P.M., and on Tuesday, May 29, from 7 to 10 A.M. All Cheese must be in its proper place in the Showyard by 10 o'clock on Tuesday morning, May 29, as the judging of Cheese will take place on that day.

49. Butter (except in Class 148) and Cream will be received in the Yard on Monday and Tuesday, May 28 and 29, from 7 A.M. to 6 P.M., and from 6 to 8 A.M., on Wednesday, May 30. The Butter in Class 148 must be delivered to the Society's Secretary, care of Messrs. Bowyer and Baker, 11, North Street, Guildford, on or before May 2nd.

50. No Exhibitor shall make more than two entries in any one class of Cheese, or more than one entry in any one class of Butter or Cream. The Cheese, Butter or Cream must in every case have been made in the Exhibitor's own Dairy by himself, his family or his servants.

51. Any Cheese bored or marked will be disqualified. Any distinctive mark on the Butter or its cloth will disqualify.

52. The winners of first prizes in the Cheese Classes will have to give one Cheese (which the Judges will select) to the Council for public disposal. The First Prize lots of Butter and Cream will be the property of the Council for public disposal. Other Exhibitors of Butter and Cream will have to give 1 lb. from each Exhibit for public tasting; and endeavour will be made to prevent damage to the Exhibits then remaining.

53. Exhibitors must very carefully answer the questions on the Entry-forms.

54. Exhibitors must make their own arrangements for the return of their exhibits, as the Society cannot undertake this.

#### BUTTER-MAKING COMPETITIONS.

55. Cream will be supplied free of charge, and the Butter will be the property of the Society.

56. The Society will supply Competitors with churns, &c., or they can bring their own appliances if they prefer to do so.

57. Competitors who work the Butter with their hands will be disqualified.

58. No previous winner of the Society's Champion Gold Medal is eligible to compete for any Prize given in the Butter-making Competitions in the Showyard.

**HORSE-SHOEING COMPETITIONS.**

All Entries must be made on the printed forms to be obtained of the Secretary, and must reach him on or before May 7, 1894. The Entry Fee is sent with the Entry.

The Competitions will take place on Friday and Saturday, June 1 and 2, at 10 o'clock, at which hour Competitors must attend at the Secretary's Office in the Showyard.

Each competitor must make and fix a fore-shoe in the Showyard, previously taken off the old shoe.

A Competitor must bring his own Tools, Nails and a Striker, but the Society will provide forges, anvils, flat iron, and fuel.

All Nag Horse Shoes must be fullered.

No Man who has already won a First Prize given by the Society for Shoeing will be eligible to compete again in the same class.

**SHEEP-SHEARING COMPETITIONS.**

All Entries must be made on the printed forms to be obtained of the Secretary, and must reach him on or before May 7, 1894. The Entry Fee is sent with the Entry.

The Competition will take place on Saturday, June 2, 1894, at 3 o'clock, at which hour Competitors must attend at the Secretary's office in the Show-

**JUDICATION OF PRIZES FOR LIVE STOCK.**

Under the By-Laws of the Society the Judges are instructed :—

Not to award any Prize or Commendation unless the animal possesses merit.

Not to award a Prize to any Horse or Mare, unless it is free from unsoundness to be transmitted to its progeny; or if a Gelding, unless free from unsoundness (an accident having temporary consequences only excepted).

In awarding Prizes to Cattle, Sheep, and Pigs, to decide according to the merits of the animals for Breeding purposes, and not to take into consideration their present value to the butcher.

To record the number of any animals which may in their opinion be undeserving of sufficient merit to succeed to vacancies caused by disqualification. Animals so placed in a Reserved List shall, in the event of any case of disqualification, succeed to the Prize or Prizes according to the Judges' award.

In the event any question arise which the Judges may desire to refer to another authority, the Stewards of Stock shall assist them in providing a Referee.

**RAILWAY ARRANGEMENTS.**

The Railway Companies agree to the following arrangements for the Conveyance of Stock to and from the Show :—

Stock to be charged full rates to the Show, but half rates on the return journey at owner's risk if unsold, and on production of a Certificate to that effect from the Secretary of the Society. The reduction to half rate is allowed when the Stock is returned to the same Station as that from which it was conveyed to the Show and by the same route.

2. Men certified by the Exhibitor and the Secretary of the Show to be *bonâ fide* in Charge of Stock to be conveyed free, provided that they travel in charge of the Animals and in the same train as the Animals; the number of men not to exceed one man to each vehicle.

3. The foregoing regulations to apply to Animals whether carried in horse boxes by passenger or special train, or in cattle trucks by luggage trains. The concession as to Animals in horse boxes is granted only on the condition that the present orders of the Board of Agriculture, under which the Companies are not required to disinfect horse boxes, remain in force. If the unsold Stock, which was conveyed on the Outward Journey by Goods Train in Cattle Trucks, be required to be returned by Passenger Train in Horse Boxes, half the Passenger rates will be charged, and *vice versâ*.

4. The Railway Companies will provide specially constructed covered Cattle Trucks at a reduced rate of charge, further proportionate reduction being made when more than one Animal is carried.

To insure prompt delivery of Stock, Exhibitors are recommended to ascertain the *proper time for loading* from the Superintendent or Booking Clerk at the Station from which their Stock is intended to be despatched.

*Telegraphic Address*—"PLOWMAN," BATH.

## GUILDFORD MEETING,

MAY 30, 31, JUNE 1, 2, AND 4, 1894.

## PRIZES FOR POULTRY.

Section 1.—GENERALLY USEFUL BREEDS.	First Prize.	Second Prize.	Third Prize.
	£ s.	s. d.	s. d.
COCHINS (Cinnamon and Buff)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
COCHINS (Partridge-Feathered or White)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
BRAHMAS (Dark)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
BRAHMAS (Light)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
LANGSHANS—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
PLYMOUTH ROCKS—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
WYANDOTTE—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
ORPINGTON—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
CHICKENS OF 1894 (Cochin, Brahma, Langshan, Ply- mouth Rock, Wyandotte, or Orpington)—Cockerel . . . . .	1 10	15 0	5 0
Ditto—Pullet . . . . .	1 10	15 0	5 0
Section 2.—LAYING, OR NON-SETTING BREEDS.			
SPANISH—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
MINORCAS—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
LEGHORNS (any Variety)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
HOUDANS—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
POLISH FOWL—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
HAMBURGS (Golden Spangled)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
HAMBURGS (Silver Spangled)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
HAMBURGS (Golden Pencilled)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
HAMBURGS (Silver Pencilled)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
HAMBURGS (Black)—Cock . . . . .	1 10	15 0	5 0
Ditto—Hen . . . . .	1 10	15 0	5 0
CHICKENS OF 1894 (Spanish, Minorca, Leghorn, Houdan, Polish, or Hamburg)—Cockerel . . . . .	1 10	15 0	5 0
Ditto—Pullet . . . . .	1 10	15 0	5 0

Section 3.—BREEDS SUITABLE FOR THE TABLE.		First Prize.	Second Prize.	Third Prize.
CLASS		£ s.	s. d.	s. d.
41.—DORKINGS (Coloured)—Cock		1 10	15 0	5 0
42.—Ditto—Hen		1 10	15 0	5 0
43.—DORKINGS (Silver Grey)—Cock		1 10	15 0	5 0
44.—Ditto—Hen		1 10	15 0	5 0
45.—DORKINGS (White or Cuckoo)—Cock		1 10	15 0	5 0
46.—Ditto—Hen		1 10	15 0	5 0
47.—GAME (Black-Breasted Reds)—Cock		1 10	15 0	5 0
48.—Ditto—Hen		1 10	15 0	5 0
49.—GAME (Brown-Breasted Reds)—Cock		1 10	15 0	5 0
50.—Ditto—Hen		1 10	15 0	5 0
51.—GAME (Pile or any other Variety)—Cock		1 10	15 0	5 0
52.—Ditto—Hen		1 10	15 0	5 0
53.—GAME (Old English)—Cock		1 10	15 0	5 0
54.—Ditto—Hen		1 10	15 0	5 0
55.—MALAYS—Cock		1 10	15 0	5 0
56.—Ditto—Hen		1 10	15 0	5 0
57.—INDIAN GAME—Cock		1 10	15 0	5 0
58.—Ditto—Hen		1 10	15 0	5 0
59.—ANY OTHER DISTINCT VARIETY NOT MENTIONED— Cock		1 10	15 0	5 0
60.—Ditto—Hen		1 10	15 0	5 0
61.—CHICKENS OF 1894—(Dorking, Game, Malay, Indian Game, or any other Variety not mentioned)— Cockerel		1 10	15 0	5 0
62.—Ditto—Pullet		1 10	15 0	5 0
63.—CHICKENS OF 1894 (either pure-bred or cross-bred)— Two Cockerels		1 10	15 0	5 0
64.—CHICKENS OF 1894 (either pure-bred or cross-bred)— Two Pullets		1 10	15 0	5 0
SELLING CLASSES.				
65.—ANY DISTINCT BREED—Cock ( <i>price not to exceed</i> <i>1l. 1s.</i> )		1 10	15 0	5 0
66.—ANY DISTINCT BREED—Hen ( <i>price not to exceed</i> <i>1l. 1s.</i> )		1 10	15 0	5 0
67.—ANY DISTINCT BREED—Cock and Hen ( <i>price not to</i> <i>exceed 30s.</i> )		1 10	15 0	5 0
Section 4.—DUCKS, GEESE, AND TURKEYS.				
68.—DRAKE OR DUCK (Rouen or Aylesbury)		1 10	15 0	5 0
69.—Ditto (Pekin)		1 10	15 0	5 0
70.—COUPLE OF DUCKLINGS (any Pure or Cross-bred Variety)		1 10	15 0	5 0
71.—GANDER OR GOOSE (any Variety)		1 10	15 0	5 0
72.—TURKEYS—Cock or Hen		1 10	15 0	5 0
Section 5.—FANCY BREEDS.				
73.—BANTAMS (Black or white)—Cock		1 0	10 0	5 0
74.—Ditto—Hen		1 0	10 0	5 0
75.—BANTAMS (Game, any Variety)—Cock		1 0	10 0	5 0
76.—Ditto—Hen		1 0	10 0	5 0
77.—BANTAMS (any other District Variety)—Cock		1 0	10 0	5 0
78.—Ditto—Hen		1 0	10 0	5 0

# POULTRY.

## CONDITIONS AND REGULATIONS.

### CHARGES, &c.

1. Exhibitors may make an unlimited number of Entries in each Class on payment of fees as follows:—

Classes 1 to 64 inclusive . . .	5s. per entry.
„ 65 to 67 „ . . .	3s. „
„ 68 to 72 „ . . .	5s. „
„ 73 to 78 „ . . .	3s. „

The above fees include coops, food, and attendance.

N.B.—The above Fees *must* be sent with the Entries, or no notice will be taken of the latter.

2. All entries must be made on the printed forms, to be obtained of the Secretary (THOS. F. FLOWMAN, 4, Terrace Walk, Bath), and such forms must be correctly filled up and returned to the Secretary, together with all fees due, on or before May 7th. Exhibitors are requested to carefully examine the List of Prizes and Conditions, as the Society cannot be responsible for any errors made by Exhibitors in the Entry forms, and birds entered in a wrong Class will be necessarily excluded from competition. No alterations can be made in Entry forms after they have been received by the Secretary.

3. The Council reserve the right to refuse the entries of any person.

4. Exhibitors must state the price, breed, and age of their birds on their Entry forms.

### SHOWYARD.

5. All birds must be in the Showyard on *Tuesday, May 29th*, and no bird can be removed before Monday, June 4th, at 7 P.M. Any Exhibitors who send for their birds must do so between 7 and 8 P.M. on that day.

6. All carriage must be prepaid to Guildford Railway Station, otherwise the birds will not be received at the Exhibition; but they will be conveyed free of expense from the Station to the Showyard and back.

7. No Exhibitor or Servant will be allowed into the tent until the birds have been judged.

8. The Poultry Tent will not be open to the public until 2 o'clock on the first day of the Exhibition.

9. One Admission Ticket, available whenever the Show is open to the public, will be given to each Exhibitor whose Entry-fees amount to 1*l.* and upwards.

### TABLE POULTRY.

10. In classes 63 and 64, quality for the table will be considered before mere weight. The date of hatching must be given, and in the case of cross-bred birds, the breeds of the parents.

### SALES.

11. All birds may be claimed, at the price put upon them, any time after 4 o'clock on Wednesday, May 30th, and a sale *must take place* if the price stated be paid to the Clerk in the Poultry Office at the time of claiming. *No alteration can be made in the prices stated on the Entry forms and in the Catalogue until after Friday, June 1st*, when the price may be reduced on payment to the Stewards of 1*s.* per pen on each alteration. Birds must be *sold in pens*, and the price stated must include the basket. A charge of 10 per cent. will be made for all birds sold. The persons who have the management of the sales cannot take charge of birds which are disposed of privately.

## DISQUALIFICATIONS.

12. The Judges are empowered to withhold a prize or prizes where birds are not considered of sufficient merit, or to disqualify any that have been clipped, drawn, trimmed, marked, or dyed, and an Exhibitor detected in a false statement as to the age, &c., of any bird, or in any other practice calculated to deceive or mislead the Judges or Stewards, shall forfeit all or any prizes awarded to him or her at the Show, and will be disqualified from competing at any future Show of the Society.

13. Unhealthy birds will not be exhibited, but will be immediately returned to their owners, and the fees will be forfeited.

## PROTESTS.

14. In order to check frivolous and vexatious protests, no protest will be entertained unless accompanied by a deposit of 1*l.* in each case; and in case the protest is not substantiated, the deposit may be forfeited to the funds of the Society. All protests must be made before 12 o'clock (noon) on Thursday, May 31st.

## FORFEITS.

15. Persons entering birds, and failing to send the same to the Exhibition, will forfeit the entrance fee for each pen so left vacant.

## GENERAL.

16. All birds shown must be *bonâ fide* the property of the Exhibitor.

17. For each pen entered, the Exhibitor will receive a Label, on the reverse side of which he must legibly write his name and address for the return journey.

18. All Eggs laid at the Exhibition will be destroyed.

19. The Stewards pledge themselves to take every care of the birds exhibited, but neither they nor the Society will in any case be responsible for any accident, loss, or damage, from whatever cause arising, the exhibits being entered at the sole risk of the Exhibitors, and Exhibitors will be required to hold the Society harmless in the event of loss.

20. In case of death of any bird during the Exhibition, it will be sent back for the inspection of the Exhibitor.

21. The Poultry Department is subject to the rules and regulations of the Society, and its officers.

\* \* \* *The use of properly-constructed poultry baskets will facilitate the safe and speedy conveyance of the specimens to and from the Exhibition.*

*The Society cannot, under any circumstances, undertake to send telegrams to Exhibitors as to Judges' Awards.*

*Applications for Catalogues (price 1*s.* each) and printed lists of Awards should be made to the Publishers, Messrs. W. LEWIS AND SONS, Heral'd Office, Ba'h.*

# FINANCIAL STATEMENTS

FOR

1893

*WITH ITEMS OF 1892 FOR COMPARISON.*

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# The Bath and West and

## SUMMARY OF THE CASH ACCOUNT

### WITH COMPARATIVE

Dr.

RECEIPTS.	1893. GLOUCESTER.		1892. SWANSEA.
	£ s. d.	£ s. d.	£ s. d.
<b>General Receipts:—</b>			
Dividends and Interest . . . . .	656 19 8		576 6 6
Subscriptions from Members . . . . .	1,122 5 0		1,127 14 0
Life Compositions . . . . .	89 0 0		140 10 0
Journal . . . . .	37 1 8		40 14 2
Sale of Office Furniture . . . . .	3 4 11		1 15 6
		1,908 11 3	1,887 0 2
<b>Show Receipts:—</b>			
Implements . . . . .	2,079 1 10		1,470 17 6
Horses . . . . .	378 4 0		288 13 6
Cattle, Sheep, and Pigs . . . . .	593 15 0		505 14 0
Catalogues, &c. . . . .	104 16 1		120 13 11
	1,076 15 1		915 1 5
Poultry . . . . .	124 8 6		108 11 6
Arts . . . . .	5 15 8		6 7 0
Art Union . . . . .	79 17 0		85 0 0
Art-Manufactures . . . . .	126 12 0		105 12 0
	212 4 8		196 19 0
Horse Shoeing . . . . .	35 5 0		11 15 0
Music . . . . .	17 4 10		17 9 6
Cheese and Butter . . . . .	99 2 3		92 12 2
Working Dairy . . . . .	171 8 6		193 18 3
Flannel and Knitting . . . . .	..		27 6 0
Refreshment Contracts . . . . .	431 0 0		348 0 0
Admissions . . . . .	3,708 6 0		4,961 11 0
Unapportionable:—			
Cloak Rooms, &c. . . . .	35 0 0		30 0 3
Stand Fittings . . . . .	323 14 7		205 12 3
	358 14 7		235 12 6
Subscription from Guildford for 1894 Show . . . . .	800 0 0		800 0 0
		9,113 11 3	9,379 13 4
Field Experiments . . . . .		150 0 0	150 0 0
Dairy Schools . . . . .		3,397 13 2	4,417 3 7
		14,569 15 8	15,833 17 1
<b>BALANCE BROUGHT FORWARD, JAN. 1, 1893 .</b>		1,233 0 6	213 15 7
		15,802 16 2	16,047 12 8

**Western Counties Society.****THE YEAR ENDING DEC. 31st, 1893,  
ACCOUNT FOR 1892.****CR.**

<b>PAYMENTS.</b>	<b>1893. GLOUCESTER.</b>		<b>1892. SWANSEA.</b>	
	<b>£</b>	<b>s. d.</b>	<b>£</b>	<b>s. d.</b>
<b>General Expenses:—</b>				
Salaries . . . . .	775	0 0	775	0 0
Rent, Postage, Stationery, &c. . . . .	287	1 4	247	13 7
Journal . . . . .	477	14 2	522	13 1
		1,539 15 6		1,545 6 8
<b>Show Expenses:—</b>				
Implements . . . . .	872	3 0	595	11 5
Horses . . . . .	1,008	17 6	695	3 9
Cattle, Sheep, and Pigs . . . . .	2,373	10 3	2,249	6 9
Fodder, &c. . . . .	448	0 8	484	13 1
	3,830	8 5	3,429	3 7
Poultry . . . . .	315	15 8	284	13 4
Arts . . . . .	300	2 9	276	7 3
Art Union . . . . .	181	4 7	184	14 9
Art-Manufactures . . . . .	69	2 6	65	13 4
	550	9 10	526	15 4
Horse Shoeing . . . . .	64	2 9	20	3 1
Music . . . . .	213	18 9	216	14 3
Horticulture . . . . .	258	16 6	..	
Cheese and Butter . . . . .	276	5 0	239	17 7
Working Dairy . . . . .	509	7 7	492	16 11
Bees . . . . .	10	0 0	10	0 0
Flannel and Knitting . . . . .	..		18	8 2
Refreshment Contracts . . . . .	57	14 7	54	15 10
Public Announcements . . . . .	563	12 11	429	8 11
<b>Unapportionable:—</b>				
Stand Fittings . . . . .	288	6 7	171	1 9
Erection of Offices, &c. . . . .	459	18 7	509	19 1
Carriage of Plant . . . . .	124	10 10	95	9 5
Police . . . . .	98	18 11	203	2 9
Miscellaneous . . . . .	436	17 7	382	12 10
	1,408	12 6	1,362	5 10
		8,931 7 6		7,680 14 3
Field Experiments . . . . .	149	7 11	257	14 5
Dairy Schools . . . . .	3,736	19 9	3,830	16 10
	14,357	10 8	13,314	12 2
Investments and Deposit . . . . .	1,000	0 0	1,500	0 0
Balance in Bank . . . . .	445	5 6	1,233	0 6
		15,802 16 2		16,047 12 8

checked and found correct,  
**ALBERT GOODMAN, F.C.A.,**  
*Auditor.*  
 January 18th, 1894.

Passed by Council,  
 January 30th, 1894.  
**THOS. F. FLOWMAN,**  
*Secretary.*

**The Bath and West and**

**DR. CASH ACCOUNT FOR THE YEAR ENDING DEC. 31:**

RECEIPTS.	1898.		1899.
	GLOUCESTER.		SWANSE
	£	s. d.	£ s.
DIVIDENDS AND INTEREST . . . . .	..	656 19 8	576 6
SUBSCRIPTIONS FROM MEMBERS:—			
Arrears . . . . .	25	16 0	21 4
Governors . . . . .	242	10 0	245 1
Subscribers of £1 and upwards . . . . .	824	9 0	830 1
Ditto of 10s. . . . .	29	10 0	30 1
		1,122 5 0	1,127 1
LIFE COMPOSITIONS . . . . .	..	89 0 0	140 1
JOURNAL:—			
Sales . . . . .	14	9 5	15 1
Advertisements . . . . .	22	12 3	25
		37 1 8	40 1
SALE OF OFFICE FURNITURE . . . . .	..	3 4 11	1 1
IMPLEMENTS:—			
Entry Fees . . . . .	95	10 0	72 1
Fees for Space:—			
Machinery-in-Motion Shedding . . . . .	317	10 0	215 1
Ordinary Shedding . . . . .	522	10 0	346
Miscellaneous Shedding . . . . .	485	17 0	393
Boarded Do. . . . .	276	0 0	201 1
Seed Do. . . . .	74	10 0	39 1
Uncovered Ground . . . . .	153	6 4	86 1
Catalogue Fees . . . . .	153	18 6	115 1
		2,079 1 10	1,470 1
Carried forward . . . . .	..	£ 3,987 13 1	

**thvern Counties Society.****WITH COMPARATIVE STATEMENT FOR 1892.****CR.**

P A Y M E N T S.	1893. GLOUCESTER.		1892. SWANSEA.
	£ s. d.	£ s. d.	£ s. d.
<b>GENERAL:—</b>			
<b>Salaries:—</b>			
Secretary (including Clerks, Gas, Coal, Lodgings at Show, &c.) . . . . .	700 0 0		700 0 0
Auditor . . . . .	20 0 0		20 0 0
Consulting Chemist . . . . .	30 0 0		30 0 0
Consulting Botanist . . . . .	25 0 0		25 0 0
		775 0 0	775 0 0
Printing . . . . .	38 11 6		35 13 5
Stationery and Finance Books . . . . .	49 17 6		45 0 10
Postage, Telegrams, Cheque and Receipt Stamps . . . . .	76 5 5		68 14 10
Rent of Offices . . . . .	26 0 0		26 0 0
Travelling Expenses . . . . .	31 14 7		24 7 0
Carriage of Goods . . . . .	13 14 8		6 13 4
Directories and Reference Books . . . . .	2 16 2		2 14 2
Finance Committee's Expenses . . . . .	8 15 11		11 18 0
Subscription to Bath Literary Institution . . . . .	2 2 0		2 2 0
Repairs . . . . .	7 10 4		9 15 6
Hire of London Council Room . . . . .	4 14 6		4 14 6
Office Furniture . . . . .	2 17 9		10 0 0
Grant to Mrs. Janes (widow of late Foreman of Plant) . . . . .	20 0 0		..
Grant to Somerset Chamber of Agriculture, &c. . . . .	2 1 0		..
		287 1 4	247 13 7
<b>JOURNAL:—</b>			
Editor . . . . .	100 0 0		100 0 0
Associate Editor . . . . .	100 0 0		100 0 0
Printing and Binding . . . . .	185 6 3		238 16 10
Plans . . . . .	3 14 6		3 15 0
Postage, Stationery and Journal Distribution . . . . .	36 17 5		37 2 9
Payments to Authors . . . . .	51 16 0		40 0 0
Railway Fares . . . . .	..		2 18 6
		477 14 2	522 13 1
<b>MPLEMENTS:—</b>			
Shedding . . . . .	774 3 8		503 14 5
Stewards and Assistants . . . . .	54 0 10		56 5 7
Printing and Stationery . . . . .	42 18 6		35 11 5
Fees returned . . . . .	1 0 0		..
		872 3 0	595 11 5
Carried forward . . . . .	..	£ 3,411 18 6	

GLOUCESTER MEETING, 1893. ( cii )

DR.

CASH ACCOUNT—*continued.*

RECEIPTS.	1893.		189
	GLOUCESTER.		SWAN
	£	s. d.	£
Brought forward . . . .	..	3,987 13 1	..
<b>HORSES, CATTLE, SHEEP, AND PIGS:—</b>			
	£	s. d.	
Horses:—Entry Fees . . . .	136	10 0	98 1
Fines and Forfeits . . . .	5	15 0	5
Grand Stand Admissions . . . .	85	19 0	100
Special Prizes . . . .	150	0 0	85
	378	4 0	288 1
Cattle, Sheep and Pigs:—Entry Fees .	374	15 0	235
Fines . . . .	20	0 0	20
Special Prizes . . . .	199	0 0	200
	593	15 0	505
Hurdles . . . .	20	0 0	22
Catalogues . . . .	80	14 1	80
Manure and Fodder . . . .	4	2 0	17
	104	16 1	120
		1,076 15 1	915
<b>POULTRY:—</b>			
Entry Fees . . . .	112	1 0	97
Special Prizes . . . .	10	0 0	10
Commission on Sales . . . .	2	7 6	1
		124 8 6	108
<b>HORSE-SHOEING:—</b>			
Entry Fees . . . .	24	5 0	11
Special Prizes . . . .	11	0 0	
		35 5 0	11
Carried forward . . . .	..	£ 5,324 1 8	

CASH ACCOUNT—*continued.*

CR.

PAYMENTS.	1893. GLOUCESTER.			1892. SWANSEA.		
	£	s.	d.	£	s.	d.
Brought forward . . . .	..			2,411	18	6
<b>HORSES, CATTLE, SHEEP, AND PIGS:—</b>						
Horses—Prizes . . . . .	£	s.	d.			
Less deferred . . . . .	596	0	0			
	65	0	0			
	531	0	0			
Shedding and Grand Stand . . . .	401	2	2			
Stewards and Assistants . . . .	46	2	7			
Judges . . . . .	29	12	9			
Fees returned, &c. . . . .	1	0	0			
	1,008	17	6			
Cattle—Prizes . . . . .	1,172	0	0			
Less deferred . . . . .	28	0	0			
	1,144	0	0			
Sheep—Prizes . . . . .	470	0	0			
Pigs—Prizes . . . . .	247	0	0			
Less deferred . . . . .	3	0	0			
	244	0	0			
Shedding and Canvas . . . . .	306	16	4			
Stewards and Assistants . . . .	45	2	7			
Judges . . . . .	161	4	10			
Utensils for Butter Test . . . .	2	6	6			
	2,373	10	3			
Hurdles . . . . .	35	15	8			
Fodder . . . . .	241	3	9			
Stewards of Fodder and Assistants . . . .	29	2	4			
Veterinary Inspector . . . . .	25	18	0			
Rosettes . . . . .	10	7	0			
Printing and Stationery . . . .	63	15	4			
Deferred Prizes (1892) . . . .	30	0	0			
Refreshments to Judges . . . .	11	18	7			
Do. (1891) . . . . .	..					
Miscellaneous . . . . .	..					
	448	0	8			
	3,830	8	5			
<b>POULTRY:—</b>						
Marquee, Staging and Sheds . . . .	60	1	1			
Stewards and Assistants . . . .	29	14	4			
Judges . . . . .	14	7	2			
Prizes . . . . .	192	5	0			
Food and Pens . . . . .	7	3	1			
Printing and Stationery . . . .	3	4	0			
Cartage, Hampers, &c. . . . .	9	1	0			
	315	15	8			
<b>HORSE-SHOEING:—</b>						
Prizes . . . . .	26	18	6			
Judges . . . . .	18	17	4			
Printing . . . . .	2	4	6			
Anvils, Forges, Coals and Horses . . . .	16	2	5			
	64	2	9			
Carried forward . . . . .	£6,622	5	4			

GLOUCESTER MEETING, 1893. ( civ )

DR. CASH ACCOUNT—continued.

RECEIPTS.	1893. GLOUCESTER.			1892. SWANSEA
	£	s.	d.	£ s. d.
Brought forward . . . . .	..			5,224 1 8
ARTS:—				
Commission on Picture Sales, &c. . . . .	0	15	8	1 7
Catalogues . . . . .	5	0	0	5 0
				5 15 8
				6 7
ART UNION:—				
Sale of Tickets . . . . .	78	0	0	85 0
Excess paid on Prizes. . . . .	1	17	0	..
				79 17 0
				85 0
ART MANUFACTURES:—				
Fees for Space . . . . .	..			126 12 0
				105 12
MUSIC:—				
Admissions to Enclosure . . . . .	..			17 4 10
				17 9
CHEESE AND BUTTER:—				
Entry Fees . . . . .	68	7	6	50 17
Cheese and Butter Sales . . . . .	2	4	9	7 14
Special Prizes . . . . .	28	10	0	34 0
				99 2 3
				92 15
WORKING DAIRY:—				
Admissions . . . . .	34	12	0	84 10
Entry Fees, Buttermaking Competitions . . . . .	73	0	0	43 1
Ditto Dairy Appliances . . . . .	21	16	6	9 1
Sale Premium . . . . .	20	0	0	20 0
Sale of Straw . . . . .	22	0	0	20 0
Special Prizes . . . . .	..			16 0
				171 8 6
				193 1
Carried forward . . . . .	..			5,724 1 11

**CASH ACCOUNT—continued.****CR.**

P A Y M E N T S .	1893. GLOUCESTER.			1892. SWANSEA.		
	£	s.	d.	£	s.	d.
Brought forward . . . . .	..			6,622	5	4
<b>ARTS:—</b>						
Labour and Fittings . . . . .	67	0	7			60 11 4
Stewards and Assistants . . . . .	36	9	6			33 1 10
Selectors . . . . .	20	0	0			20 0 0
Receiving Steward . . . . .	40	0	0			40 0 0
Do for Labour and Materials . . . . .	37	19	6			39 15 11
Local Agents and Carriage . . . . .	86	1	7			72 9 2
Printing and Stationery . . . . .	10	19	8			7 7 0
Damaged Pictures . . . . .	1	11	11			4 2 0
				300	2	9
<b>ART UNION:—</b>						276 7 3
Pictures purchased . . . . .	162	18	7			167 6 9
Printing and Stationery . . . . .	8	8	0			6 16 0
Advertising . . . . .	2	2	0			2 2 0
Commission on Sale of Tickets . . . . .	7	16	0			8 10 0
				181	4	7
<b>ART-MANUFACTURES:—</b>						184 14 9
Labour and Fittings . . . . .	60	14	2			55 14 4
Steward and Assistants . . . . .	4	2	10			6 15 0
Printing . . . . .	4	5	6			3 4 0
				69	2	6
<b>MUSIC:—</b>						65 13 4
Bands and their Fares . . . . .	167	6	9			167 17 10
Erecting Band Stands and Seats . . . . .	33	10	4			34 17 5
Steward and Assistants . . . . .	13	1	8			13 13 9
Printing and Stationery . . . . .	..					0 5 3
				213	18	9
<b>HORTICULTURE:—</b>						216 14 3
Gratuities to Gardeners . . . . .	114	10	0			
Erecting and Repairing Tent and Staging . . . . .	112	3	6			
Steward and Assistants . . . . .	21	6	6			
Printing, Advertising, Carriage, &c. . . . .	10	16	6			
				258	16	6
<b>CHEESE AND BUTTER:—</b>						
Judges . . . . .	13	4	0			15 14 3
Prizes . . . . .	196	10	0			178 10 0
Steward and Assistants . . . . .	9	4	0			4 5 0
Shedding . . . . .	46	18	8			33 17 3
Printing, Stationery, &c. . . . .	3	10	0			3 11 5
Grass Table for Butter . . . . .	6	8	4			3 19 8
Carriage . . . . .	0	10	0			..
				276	5	0
<b>WORKING DAIRY:—</b>						239 17 7
Steward and Assistants . . . . .	54	5	5			55 17 5
Judges and Demonstrators . . . . .	71	19	3			66 14 2
Building . . . . .	264	1	2			266 17 3
Printing, Stationery, Postage, and Insurance . . . . .	10	12	7			9 16 0
Utensils and Carriage . . . . .	28	18	11			10 1 4
Prizes . . . . .	64	19	2			57 19 2
Coal, Salt, Ice, Cloths, &c. . . . .	14	11	1			5 11 7
Sale Premium Returned . . . . .	..					20 0 0
				509	7	7
Carried forward . . . . .	..	£	8,431 3 0			492 16 11



GLOUCESTER MEETING, 1893. ( cvi )

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.		1893. GLOUCESTER.		1892. SWANSEA.	
		£	s. d.	£ s. d.	£ s. d.
Brought forward		..		5,724 1 11	..
FLANNEL AND KNITTING		..		..	27
FIELD EXPERIMENTS:—					
Government Grant for 1892		..		150 0 0	150
ADMISSIONS TO SHOWYARD:—					
Admissions at 2s. 6d.		1,672	0 0		2,061
Ditto at 1s.		1,458	0 0		2,491
Children at 1s.		36	12 0		6
Ditto at 6d.		80	4 0		11
Season Tickets		61	10 0		21
				3,708 6 0	4,96
SHOW REFRESHMENT CONTRACTS:—					
Sale Premiums		..		431 0 0	34
SHOW RECEIPTS UNAPPORTIONABLE:—					
Exhibitors for Stand-fittings		323	14 7		2
Cloak Room, Parcels Office, and Photographs		35	0 0		
				358 14 7	2
SUBSCRIPTIONS FROM TOWNS:—					
Guildford, for 1894 Show		..		200 0 0	1
Carried forward.				£ 11,172 2 6	

**CASH ACCOUNT—continued.****CR.**

P A Y M E N T S.	1893. GLOUCESTER.			1892. SWANSEA.		
	£	s.	d.	£	s.	d.
Brought forward . . . . .	.	.	.	8,431	3	0
<b>BEES:—</b>						
Grant from Council for Bee Tent . . . . .	..			10	0	0
<b>FLANNEL AND KNITTING</b> . . . . .	..			..		
<b>FIELD EXPERIMENTS:—</b>						
Farmers, Bailiffs and Superintendence . . . . .	46	0	0	101	17	0
Manures . . . . .	37	2	8	78	6	7
Stewards' Assistant, and Postage . . . . .	13	15	0	18	15	0
Printing and Stationery . . . . .	29	7	9	28	17	9
Steward's Travelling and Hotel Expenses . . . . .	23	2	6	27	13	1
Analyses . . . . .	..			2	5	0
			149	7	11	257
<b>PUBLIC ANNOUNCEMENTS:—</b>						
Advertising . . . . .	293	16	9	209	17	5
Bill Posting . . . . .	114	11	0	122	1	4
Printing . . . . .	151	5	2	93	10	2
Rent of Placard-Frames Stores . . . . .	4	0	0	4	0	0
			563	12	11	429
<b>SHOW REFRESHMENT CONTRACTS:—</b>						
Tent and Shedding . . . . .	52	12	1	49	13	2
Printing, &c. . . . .	5	2	6	5	2	8
			57	14	7	54
<b>SHOW EXPENSES UNAPPORTIONABLE:—</b>						
Erection of Offices and other Buildings . . . . .	459	18	7	509	19	1
Carriage and Storage of Plant . . . . .	124	10	10	95	9	5
Stewards of Works . . . . .	27	4	6	23	18	6
Exhibitors' Stand Fittings . . . . .	288	6	7	171	1	9
Extension of Telegraph Wires . . . . .	9	17	0	7	5	6
Insurance of Plant . . . . .	4	10	0	4	10	0
Hire of Furniture . . . . .	14	10	0	9	14	0
Hire of Mess Room . . . . .	5	5	0	5	5	0
Gatekeepers . . . . .	56	3	0	67	12	0
Yardmen, Messengers, &c. . . . .	15	7	6	16	13	10
Stewards of Finance and Treasurer . . . . .	28	13	9	34	6	3
Finance Office and Treasurer's Clerks . . . . .	41	3	1	42	1	1
Police . . . . .	98	18	11	203	2	9
Badges, &c. . . . .	3	3	3	2	14	3
Catalogues for Press and Officials . . . . .	6	13	0	4	13	3
Purchase of Plant . . . . .	186	18	0	40	6	9
Printing and Stationery . . . . .	35	13	3	28	9	8
Commission on Sale of Season Tickets . . . . .	1	13	3	5	12	8
Carriage and Sundries . . . . .	0	3	0	14	10	1
Grant to Bath Local Committee (1891) . . . . .	..			50	0	0
„ Swansea Horse Show . . . . .	..			25	0	0
			1,408	12	6	1,362
Carried forward . . . . .			£10,620	10	11	

GLOUCESTER MEETING, 1893. ( cviii )

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.		1893.		1892.
		GLOUCESTER.		SWANSEA
		£ s. d.	£ s. d.	£ s.
Brought forward . . .		..	11,172 2 6	
BUTTER SCHOOLS:—				
SOMERSET:—	£ s. d.			
Students' Fees . . .	102 8 0			110 3
Spectators' Admissions . . .	31 7 6			31 3
Sale of Produce . . .	30 4 9			112 1
Sale of Appliances . . .	0 19 0			4 9
Grant from County Council . . .	945 1 0			814 16
		1,110 0 3		1,072 14
SURREY . . . . .		..	..	250 0
KENT:—				
Grant from County Council . . . . .		319 7 6	..	750 0
GLAMORGANSHIRE . . . . .		..	..	450 0
DORSET:—				
Grant from County Council . . . . .		250 0 0		500 0
Carried forward . . . £		1,679 7 9	11,172 2 6	

## CASH ACCOUNT—continued.

CR.

PAYMENTS.	1893. GLOUCESTER.		1893. SWANSEA.
	£ s. d.	£ s. d.	£ s. d.
Brought forward . . . .	..	10,620 10 11	
<b>BUTTER SCHOOLS:—</b>			
SOMERSET:—	£ s. d.		
Teachers' Salaries and Expenses . . . .	208 10 3		213 7 0
Steward's Time and Expenses . . . .	136 8 8		98 9 8
Judges' Time and Expenses . . . .	16 17 0		26 16 8
Secretary's Travelling Expenses . . . .	4 18 6		2 13 11
Office Staff . . . .	24 7 6		24 12 6
Engineer and other Dairy Attendants . . . .	121 4 3		100 19 9
Milk and Cream . . . .	113 13 0		211 1 8
Coal, Salt, Ice, &c. . . .	47 2 9		58 2 2
Fittings . . . .	5 19 9		10 17 5
Carriage of Plant . . . .	40 17 7		36 11 5
Printing and Stationery . . . .	3 10 6		27 7 7
Postages and Telegrams . . . .	14 19 3		16 10 4
Prizes to Students . . . .	37 17 0		58 0 0
Repairing and replacing Plant . . . .	35 14 10		39 0 0
	812 0 10		924 10 1
<b>SURREY . . . . .</b>	..		115 2 6
<b>KENT:—</b>			
Teachers' Salaries and Expenses . . . .	97 10 6		200 11 3
Steward's Time and Expenses . . . .	96 2 1		218 0 5
Judges' Time and Expenses . . . .	5 1 5		23 6 0
Secretary's Travelling Expenses . . . .	4 7 0		3 7 9
Office Staff . . . .	9 7 6		18 12 6
Dairy Attendants . . . .	24 16 7		50 16 2
Milk and Cream . . . .	49 8 2		79 18 10
Coal, Salt, Ice, &c. . . .	10 11 3		41 4 7
Fittings . . . .	0 2 9		1 6 0
Carriage of Plant . . . .	10 8 6		32 16 4
Printing and Stationery . . . .	10 0 0		5 3 0
Postages and Telegrams . . . .	3 7 6		6 6 4
Prizes to Students . . . .	11 17 6		34 19 0
Repairing and replacing Plant . . . .	0 11 3		19 7 4
	333 12 0		735 15 6
<b>GLAMORGANSHIRE:—</b>			
Balance of Receipts over Expenditure paid to County Council . . . .	81 12 4		358 7 8
<b>DORSET:—</b>			
Teachers' Salaries and Expenses . . . .	200 1 0		90 15 7
Steward's Time and Expenses . . . .	144 13 1		89 2 4
Judges' Time and Expenses . . . .	13 18 4		13 15 11
Secretary's Travelling Expenses . . . .	1 7 3		1 16 3
Office Staff . . . .	17 12 6		8 17 6
Dairy Attendants . . . .	20 2 3		15 19 8
Milk and Cream . . . .	76 19 0		32 18 4
Coal, Salt, Ice, &c. . . .	27 11 8		12 1 10
Fittings . . . .	6 10 8		3 6 10
Carriage of Plant . . . .	36 17 4		10 1 8
Printing and Stationery . . . .	5 19 10		5 14 6
Postages and Telegrams . . . .	11 0 4		4 17 10
Prizes to Students . . . .	44 11 6		28 2 6
Repairing and replacing Plant . . . .	17 17 2		31 7 3
	619 1 11		348 18 0
Carried forward . . . .	£ 1,846 7 1	10,620 10 11	

**UCESTER MEETING, 1893. ( cx )**

**R. CASH ACCOUNT—continued.**

RECEIPTS.	1893. GLOUCESTER.			1892. SWANSEA.		
	£	s.	d.	£	s.	d.
Brought forward . . . . .	1,679	7	9	11,172	2	6
BUTTER SCHOOLS—continued.						
DEVON :—						
Students' Fees . . . . .		39	11 6			
Spectators' Admissions . . . . .		20	16 9			
Sales of Appliances . . . . .		0	2 6			
Grant from County Council . . . . .		250	0 0			
	310	9	9			
MISCELLANEOUS :—						
Government Grant for 1892 . . . . .		150	0 0		150	0 0
Miscellaneous . . . . .		10	13 10		14	8 0
	160	13	10		164	0 0
				2,150	11	4
CHEESE SCHOOL (Butleigh):—						
PRACTICAL SECTION :—						
Students' Fees . . . . .		187	8 0		196	0 0
Cheese and Butter sold (Autumn, 1892.)		82	14 0		195	0 3
draft from Axbridge School. . . . .					489	8 1
Do. do. (1893 drafts) . . . . .		700	10 2		..	
Sale of Cheese-making Apparatus } (1892) . . . . .		26	9 8		200	0 0
Government Grant for 1891 . . . . .					1,080	8 4
	997	1	10			
EXPERIMENTAL SECTION :—						
Government Grant for 1892 . . . . .		250	0 0		150	0 0
				1,247	1	10
					1,230	8 4
BALANCE BROUGHT FORWARD, JAN. 1, 1893 .	14,569	15	8	15,833	17	1
	1,233	0	6	213	15	7
	£ 15,802	16	2	16,047	12	8

## CASH ACCOUNT—continued.

CR.

P A Y M E N T S.	1893. GLOUCESTER.			1892. SWANSEA.			
	£	s.	d.	£	s.	d.	
Brought forward . . . . .	1,846	7	1	10,620	10	11	
UTTER SCHOOLS—continued.							
DEVON:—	£	s.	d.				
Teachers' Salaries and Expenses . . . . .	115	8	0				
Steward's Time and Expenses . . . . .	113	16	2				
Judges' Time and Expenses . . . . .	10	14	6				
Secretary's Travelling Expenses . . . . .	1	12	3				
Office Staff . . . . .	15	0	0				
Dairy Attendants . . . . .	23	15	11				
Milk and Cream . . . . .	42	6	11				
Coal, Salt, Ice, &c. . . . .	21	8	10				
Fittings . . . . .	5	1	1				
Carriage of Plant . . . . .	11	2	7				
Printing and Stationery . . . . .	2	7	0				
Postages and Telegrams . . . . .	4	6	7				
Prizes to Students . . . . .	21	11	0				
Repairing and replacing Plant . . . . .	8	5	1				
	396	15	11				
				2,243	3	0	
				2,482	13	9	
HEESE SCHOOL. (Butleigh):—							
PRACTICAL SECTION:—							
Teacher (including Board and Lodgings) . . . . .	115	8	6	113	18	0	
Steward's Time and Expenses . . . . .	51	14	11	44	1	4	
Supervisor's Expenses . . . . .	15	0	0	13	0	0	
Bailliff's Wages . . . . .	43	15	0	41	15	0	
Secretary's Travelling Expenses . . . . .	1	10	8	1	8	6	
Office Staff . . . . .	12	12	6	13	2	6	
Milk . . . . .	695	15	9	558	9	0	
Rennet and Bandages . . . . .	5	19	1	4	1	2	
Coal, Salt, Ice, &c. . . . .	20	19	8	3	4	3	
Printing and Stationery . . . . .	3	9	5	6	5	5	
Postage and Telegrams . . . . .	3	5	9	5	9	7	
Advertisements . . . . .	6	10	0	13	9	6	
Students' Board . . . . .	105	3	7	76	6	6	
Repairing and replacing Plant . . . . .	28	11	10	59	8	3	
Fittings . . . . .	6	7	8	1	14	9	
Carriage of Plant . . . . .	8	1	7	1	10	10	
	1,124	5	11	..	957	4	7
EXPERIMENTAL SECTION:—							
Scientific Expert (Time and Expenses) . . . . .	215	4	8	203	5	0	
Do. (1891) . . . . .	..			25	0	0	
Expert's Assistant Do. . . . .	58	0	0	66	2	0	
Board and Lodging of Do. . . . .	32	16	5	30	3	0	
Printing Results . . . . .	62	7	9	51	8	6	
Carriage . . . . .	1	2	0	..			
Chemist . . . . .	..			15	0	0	
	369	10	10	390	18	6	
				1,493	18	9	
				14,357	10	8	
Investments and Deposit . . . . .				1,000	0	0	
				445	5	6	
Balance in Bank . . . . .				1,233	0	6	
	£ 15,802	16	2	16,047	12	8	

hereby certify that I have examined the foregoing accounts for the year 1893, compared the same with the vouchers, and found them all in order and correct.

ALBERT GOODMAN, F.C.A.,

Auditor.

1st. 18th, 1894.

Passed by Council,

Jan. 30th, 1894.

THOS. F. PLOWMAN,

Secretary.

## ASSETS AND LIABILITIES TO DECEMBER 31st, 1893, WITH COMPARISON FOR 1892.

ASSETS.	1893. GLOUCESTER.		1892. SWANSEA.		LIABILITIES.	1893. GLOUCESTER.		1892. SWANSEA.	
	£	s. d.	£	s. d.		£	s. d.	£	s. d.
INVESTMENTS			20,500 0 0		DEFERRED PRIZES.			96 0 0	55 0 0
Fair Value. Actual Cost.									
New Zealand Stock	1,568	1 6	1,500 0 0		GUILDFORD MEETING			800 0 0	800 0 0
Consols	3,001	4 0	3,209 19 6						
India Stock	9,007	10 1	8,790 0 0						
Canada Stock	1,790	13 4	2,000 0 0						
Queensland Stock	2,751	9 0	3,000 0 0						
N. S. Wales Stock	1,752	8 10	2,000 0 0						
	19,271	6 9	20,500 0 0		JOURNAL, cost of, estimated at			450 0 0	450 0 0
CASH ON DEPOSIT AT BANK			500 0 0						
PLANT (WORKS)				782 12 7	DUE TO COUNTY COUNCILS ON DAIRY SCHOOLS	224	1 11	528	7 1
Do. (SCHOOLS)				90 4 7					
SUBSCRIPTION ARREARS			872 17 2						
INTEREST DUE ON BANK DEPOSIT.			134 3 0		OUTSTANDING ACCOUNTS, General			24	8 0
GOODS IN HAND (Cheese)			6 16 4		Do. do. Schools			19	4 16
DUE FROM COUNTY COUNCILS ON DAIRY SCHOOLS ACCOUNTS									
			309 6 1						
Balance In Bank on Dec. 31, 1893			22,323 2 7					1,613	14 9
			446 5 6		Balance carried down			20,434	8 11
			22,769 8 1					22,768	8 1
Balance brought down			21,154 13 4					22,267	16 0

Audited and found correct.  
W. D. A. J. J. J.

Passed by Council

## Annual Exhibitions.

Year	Place Visited.	Prizes.			President.	Admissions.		
		Local Subscription.	Local Com- mittee.	Local Societies.	Local Rea- denda.	Total Local Contri- bution.	On 2s. 6d. days.	On 1s. Days.
1852	Taunton	£ 210	£	£	£	£	..	..
1853	Plymouth	450	..	..	..	210	..	..
1854	Bath	450	..	..	..	450	..	..
1855	Tiverton	450	..	..	..	450	..	..
1856	Yeovil	450	..	..	..	450	..	..
1857	Newton Abbot	700	..	..	..	700	..	..
1858	Cardiff	800	..	..	..	800	..	..
1859	Barnstaple	800	85	..	81	966	..	..
1860	Dorchester	900	..	..	..	900	10,709	11,949
1861	Truro	900	..	..	..	900	15,201	14,220
1862	Wells	900	..	..	..	900	10,578	4,775
1863	Exeter	900	..	..	..	900	15,635	19,284
1864	Bristol	1000	106	..	50	1156	22,377	65,678
1865	Hereford	900	358	..	..	1258	16,375	35,261
1866	Salisbury	900	57	..	..	957	7,288	18,737
1867	Salisbury	..	..	..	..	..	7,502	16,702
1868	Falmouth	900	..	..	..	900	11,393	19,495
1869	Souhampton	900	132	..	18	1050	15,340	41,290
1870	Taunton	900	..	..	..	900	17,952	33,653
1871	Guildford	900	110	..	..	1010	10,656	23,406
1872	Dorchester	800	..	..	10	810	12,791	21,517
1873	Plymouth	800	..	400	..	1200	16,665	45,744
								62,409



## ANNUAL EXHIBITIONS—continued.

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.		
			Local Committee.	Local Societies.	Local Residents.			On 22. 2d. days.	On 12. Days.	Total.
1874	Bristol . . . . .	£ 800	£ 403	£ . .	£ . .	£ 1203	Sir Massey Lopes, Bart., M.P.	37,329	72,791	110,120
1875	Croydon . . . . .	800	245	..	..	1045	R. Denyon, M.P. . . . .	14,518	26,028	40,546
1876	Hereford . . . . .	800	381	..	..	1181	Earl of Ducie . . . . .	16,396	32,645	49,041
1877	Bath . . . . .	800	215	..	..	1015	Marquis of Lansdowne . . . . .	27,625	48,852	76,477
1878	Oxford . . . . .	800	..	170	6	976	Earl of Jersey . . . . .	12,414	26,995	39,409
1879	Exeter . . . . .	800	..	..	10	810	Earl of Morley . . . . .	14,634	40,533	55,167
1880	Worcester . . . . .	800	..	254	..	1054	Earl of Coventry . . . . .	8,415	37,675	46,090
1881	Tunbridge Wells . . . . .	800	245	34	..	1079	Marquess of Abergavenny . . . . .	13,368	33,236	46,604
1882	Cardiff . . . . .	800	200	198	17	1215	Lord Tredegar . . . . .	23,941	38,680	62,621
1883	Bridgwater . . . . .	800	78	..	..	878	Lord Brooke, M.P. . . . .	17,171	31,241	48,412
1884	Maistone . . . . .	800	310	33	75	1218	Viscount Holmesdale . . . . .	13,501	31,053	44,554
1885	Brighton . . . . .	800	227	33	82	1142	Viscount Hampden . . . . .	9,637	39,851	49,488
1886	Bristol . . . . .	800	525	..	..	1325	Lord Carlingford . . . . .	29,580	70,999	100,579
1887	Dorchester . . . . .	800	..	112	..	912	Earl of Ichester . . . . .	8,860	29,846	38,706
1888	Newport (Mon.) . . . . .	800	100	..	..	900	Lord Tredegar . . . . .	14,878	38,567	53,445
1889	Exeter . . . . .	800	..	..	10	810	Lord Clinton . . . . .	16,480	36,195	52,600
1890	Rochester . . . . .	800	294	..	26	1120	Earl of Darnley . . . . .	3,480	48,314	51,794
1891	Bath . . . . .	800	50	103	100	1053	Earl Temple . . . . .	23,510	52,185	75,695
1892	Swansea . . . . .	800	200	100	10	1110	Sir J. T. D. Llewelyn, Bart.. . . .	18,364	54,609	72,973
1893	Gloucester . . . . .	800	400	..	..	1200	Lord Fitzhardinge . . . . .	14,272	40,368	54,640
1894	Guildford . . . . .	800	..	..	..	..	Earl of Onslow . . . . .	..	..	..

# Bath and West and Southern Counties Society,

FOR THE

*encouragement of Agriculture, Arts, Manufactures, and Commerce.*

## List of Members.

CORRECTED TO JANUARY 30TH, 1894, INCLUSIVE.

### PATRON.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.

### PRESIDENT

FOR 1893-94.

THE RIGHT HON. THE EARL OF ONSLOW, G.C.M.G.

### TRUSTEES.

RIGHT HON. SIR T. D. ACLAND, BART.

SIR J. F. LENNARD, BART.

SIR R. H. PAGET, BART., M.P.

*Names thus (\*) distinguished are Governors.*

*Names thus (†) distinguished are Life Members.*

\* Members are particularly requested to make the Secretary acquainted with any errors in the names or residences.

Name.	Residence.	Sub- scriptions.
THE PRINCE OF WALES, HIS ROYAL HIGHNESS		£ s. d.
THE PRINCE OF WALES, H.R.H. The Duke of, K.G.	Sandringham, Norfolk . . . .	. . .
BERKSHIRE, Marquess of, K.G.	York Cottage, Sandringham . .	. .
DE VON, B. St. John . . . .	Eridge Castle, Tunbridge Wells .	2 0 0
DE VON, B. St. John . . . .	Huntley Manor, Huntley, near Gloucester . . . . .	. .
DE VON, Sir H. W., Bart., K.C.B., M.D., &c. . . .	Oxford . . . . .	. .
DE VON, Right Hon. Sir T. Dyke, Bart. . . . .	Killerton, Exeter . . . . .	5 0 0
DE VON, Alfred Dyke . . . .	38, Pont Street, Belgrave Square, London, S.W. . . . .	1 0 0
DE VON, Charles T. D. . . . .	Killerton, Exeter . . . . .	1 0 0
DE VON, A. H. Dyke, M.P. . .	Clynnog, Carnarvon . . . . .	. .
DE VON, A. . . . .	Horner Farm, West Luccombe, Minehead . . . . .	0 10 0
DE VON, George . . . . .	Royal Prize Farm, Pidnel, Faringdon, Berks . . . . .	1 0 0
DE VON, I)		
DE VON, IV.—F. S.		

Name.	Residence.	Subscriptions.	
		£	s. d.
Adams, S. W., jun. . . . .	7, Boringdon Villas, Plympton St.		
	Mary . . . . .	1	1 0
*Addington, Lord . . . . .	Addington House, Winslow, Bucks. . . . .	2	2 0
Affleck, W. . . . .	Prospect House, Swindon . . . . .	1	0 0
†Agate, Alfred . . . . .	Broomhall, Horsham . . . . .		
Aiken, J. C. . . . .	The Glen, Stoke Bishop, Gloucestershire . . . . .	1	0 0
Alexander, D. T. . . . .	Cardiff . . . . .	1	1 0
†Allen, Col. E. . . . .			
†Allen, James D. . . . .	Springfield House, Shepton Mallet		
Allen, Joseph . . . . .	Weston House, Evercreech . . . . .	1	0 0
Allmand, F. . . . .	Victoria Flour Mills, Wrexham . . . . .	1	0 0
Ambrose, H. . . . .	3, Quiet Street, Bath . . . . .	1	0 0
*†Amherst, Earl . . . . .	Montreal, Sevenoaks . . . . .		
Anderson, R. . . . .	Cirencester . . . . .	1	0 0
Anglo-Bavarian Brewery Co.	Shepton Mallet . . . . .	1	0 0
Anglo-Swiss Condensed Milk Co. . . . .	Chippenham . . . . .	1	0 0
Archer, C. . . . .	Trelaske, near Launceston . . . . .	1	0 0
†Arkwright, J. H. . . . .	Hampton Court, Leominster . . . . .		
Armstrong, J. D. . . . .	Vallis Farm, Frome . . . . .	1	0 0
*Ashburton, Lord . . . . .	The Grange, Alresford, Hants . . . . .	5	0 0
Ashby, William . . . . .	East Dean, Eastbourne . . . . .	1	0 0
Ashcroft, W. . . . .	Hayes, Beckenham, Kent . . . . .	1	0 0
Ashe, J. W. L. . . . .	The Mount, Chislehurst . . . . .	1	0 0
Ashford, E. C., M.D. . . . .	The Moorlands, Bath . . . . .	1	0 0
Ashford, J. . . . .	Loxbeare, Tiverton . . . . .	1	0 0
Asprey, F. . . . .	Somerset Villa, Bath . . . . .	1	0 0
Aubrey, T. . . . .	19, Paragon, Bath . . . . .	1	0 0
†Aveling, Thomas L. . . . .	Rochester . . . . .		
Avon Manure Co. . . . .	St. Philip's Marsh, Bristol . . . . .	1	0 0
Awdry, P. D. . . . .	Chippenham . . . . .	1	0 0
Ayliffe, Arthur . . . . .	Manor Dairy, Zeals, Bath . . . . .	1	0 0
Ayre Bros. . . . .	The Avenue, High Street, Hull . . . . .	1	0 0
Ayshford-Wise, Mayor Lovat	Watts House, Bishop's Lydeard . . . . .	1	1 0
Baber, S. . . . .	Elborough Farm, Locking, Weston-super-Mare . . . . .	1	0 0
Badcock, H. Jeffries. . . . .	Taunton . . . . .	1	0 0
Badcock, W. L. . . . .	Wellington, Somerset . . . . .	1	0 0
Bagnall, G. . . . .	Westwell, Burford, Oxon . . . . .	1	1 0
Bailey, S. . . . .	Hornshay Farm, Wellington, Somerset . . . . .	1	1 0
†Baillie, Evan . . . . .	Filleigh, Chudleigh . . . . .		
Bailwood, F. H. M. . . . .	Horsington, Wincanton . . . . .	1	1 0
†Bainbridge, Captain J. H. . . . .	Beechwood, Sparkwell, Plympton		
Baker, F. . . . .	Manor Farm, Frindsbury, Rochester . . . . .	1	0 0
Baker, G. E. Lloyd . . . . .	Hardwicke Court, nr. Gloucester.	1	0 0

Name.	Residence.	Sub- scriptions.		
		£	s.	d.
L. J. . . . .	Chertsey Park, Surrey . . . . .			
Robert N. G. . . . .	Heavitree, Exeter . . . . .			
S. L. . . . .	Chapel Farm, Penhow, Chepstow, Mon. . . . .	1	0	0
Samuel, jun. . . . .	Sea Stud Farm, Ilminster . . . . .	1	0	0
Thomas . . . . .	Compton, Newbury, Berks . . . . .	1	0	0
T. H. . . . .	Mere Down, Mere . . . . .	0	10	0
William . . . . .	Eastbury, Epsom Road, Guildford . . . . .	1	0	0
William . . . . .	Temple Street, Bristol . . . . .	1	0	0
W. S. . . . .	Vinesgate, Brasted, nr. Sevenoaks . . . . .	1	0	0
Samuel . . . . .	Westacott Nursery, Barnstaple . . . . .	1	0	0
on, W. E. . . . .	Barvin, Potter's Bar, Herts. . . . .	2	0	0
t, A. C. . . . .	Thirsk, Yorkshire . . . . .	1	0	0
t, A. . . . .	Wolveton, Dorchester . . . . .	1	0	0
rd, F. . . . .	Horsted Place, near Uckfield . . . . .	1	0	0
d, G. T. . . . .	College Farm, Finchley . . . . .	1	0	0
tt, Henry . . . . .	Glympton Park, Woodstock . . . . .	2	0	0
, Major William . . . . .	Moredon, North Curry, Taunton . . . . .	1	0	0
John . . . . .	Hackwood Farm, Basingstoke . . . . .	1	0	0
ot, Major Walter . . . . .	Coates, Pulborough, Sussex . . . . .	1	1	0
tt, C. H. . . . .	Pilton House, Barnstaple . . . . .			
rd, Baldwin J. P. . . . .	Kitley, Yealmpton, Ivybridge . . . . .	2	0	0
und Wells, The Right				
r. The Bishop of . . . . .	The Palace, Wells . . . . .	1	1	0
, Marquess of . . . . .	Longleat, Warminster . . . . .			
ias Co. . . . .	Bath . . . . .	1	0	0
urst, Earl . . . . .	Cirencester House, Cirencester . . . . .	2	0	0
is. . . . .	Westown, Bristol . . . . .	1	0	0
is, G. B. . . . .	Kilworthy, Tavistock . . . . .	1	0	0
, E. C., F.R.S.E. . . . .	Thornfalcon, Taunton . . . . .	1	0	0
-Pooll, R. H. . . . .	Road Manor, Bath . . . . .	1	0	0
hill, W. J. . . . .	St. Loyes, Exeter . . . . .			
on, Edward . . . . .	Broadway, Dorchester . . . . .	1	0	0
, R. . . . .	Torr Grove, Plymouth . . . . .			
, W. . . . .	Brock Hill, Broadclyst, Exeter . . . . .	1	0	0
, William . . . . .	Larking's Farm, Chiddingstone, Edenbridge, Kent . . . . .			
amp, E. B. . . . .	Trevince, Scorrier, Truro . . . . .	1	0	0
amp, W. . . . .	Stratton House, Stratton-on-the- Fosse, Bath . . . . .	1	0	0
y, M. H., M.P. . . . .	Coombe Priory, Shaftesbury . . . . .	1	0	0
i, J. F. . . . .	Primley Hill, Paignton, Torquay . . . . .	1	0	0
ett-Stanford, V. F. . . . .	Pyt House, Salisbury . . . . .			
tt, H. M. . . . .	Sparkford, near Yeovil . . . . .	1	0	0
tt, Jas. . . . .	Little Box Farm, Awre, Newn- ham, Gloucestershire . . . . .	1	0	0
tt, Jos. . . . .	Down House, Dursley, Glos. . . . .	1	0	0
tt, J. G. . . . .	Malvern Link . . . . .	1	0	0
tt Brothers . . . . .	Journal Office, Salisbury . . . . .	1	1	0
l, Edward Hammond, &				
on, R. . . . .	Heybridge, Maldon, Essex . . . . .	1	0	0
	Englefield House, Reading. . . . .	5	0	0

Name.	Residence.	Sub- scriptions.
		£ s. d.
Bere, R. . . . .	Milverton, Somerset . . . . .	1 0 0
Berridge, R. J. . . . .	Somerton, Oxon . . . . .	1 0 0
Berriman, J. . . . .	Moredon Farm, Swindon . . . . .	1 0 0
*†Bertie, Lord . . . . .	Uffington House, Stamford . . . . .	..
*†Best, Capt. John C. (R.N.). . . . .	Plas-yn-Vivod, Llangollen . . . . .	..
†Best, Col. George . . . . .	Charlton House, Ludwell, Salis- bury . . . . .	..
Best, Major M. G. . . . .	Park House, Boxley, Maidstone . . . . .	1 0 0
Best, Captain T. G. . . . .	Abbotts Ann, Andover . . . . .	1 0 0
Bevington, T. . . . .	Hedingham Castle, Castle Heding- ham, Essex . . . . .	1 1 0
Bigg, Thomas . . . . .	Leicester House, Great Dover Street, London, E.C. . . . .	0 10 0
Birchall, J. D. . . . .	Bowden Hall, Gloucester . . . . .	1 0 0
Birmingham, C. . . . .	Holnicote, near Minehead . . . . .	0 10 0
Biscoe, H. S. T. . . . .	Oakhanger, Godalming, Surrey . . . . .	1 0 0
Blackstone and Co. (Limited)	Rutland Iron Works, Stamford, Lincoln . . . . .	1 1 0
Blake, Abel . . . . .	Loxbeare, Tiverton . . . . .	0 10 0
Blake, William . . . . .	Bridge House, Ilminster, South Petherton . . . . .	1 0 0
Blinman, H. T. . . . .	Parsonage Farm, Farrington Gurney, Bristol . . . . .	0 10 0
Blundell, E. . . . .	Argyll House, Cirencester . . . . .	1 0 0
Blundell, R. C. . . . .	Benhams, Horley, Surrey . . . . .	1 0 0
Blyth, J. . . . .	Pantheon, Oxford Street, London . . . . .	1 0 0
Boby, Robert . . . . .	Bury St. Edmunds, Suffolk . . . . .	1 0 0
Bodman, G. . . . .	Park Farm, Yatton . . . . .	1 0 0
Bolitho, T. B., M.P. . . . .	Treridden, Penzance . . . . .	1 0 0
†Bond, N. . . . .	Creech Grange, Wareham, Dorset . . . . .	..
*Boteler, Capt. W. J. Casberd	The Elms, Taplow . . . . .	2 0 0
Boucher, Rev. A. F. . . . .	Kempsey Manor, Worcester . . . . .	1 0 0
†Boughton-Knight, A. R. . . . .	Downton Castle, Ludlow . . . . .	..
Bound, William . . . . .	Hurstborne, Tarrant, Andover . . . . .	1 1 0
Bourne, C. H. . . . .	Wellington Road, Dudley . . . . .	1 1 0
Bouverie, Hon. D. P. . . . .	Coleshill House, Highworth . . . . .	1 1 0
Bouverie, H. P. . . . .	Brymore, Bridgwater . . . . .	1 0 0
†Bowen-Jones, J. . . . .	Ensdon House, Montford Bridge . . . . .	..
†Bowerman, Alfred . . . . .	Capston, Williton . . . . .	..
Boys, T. H. . . . .	Bridgwater . . . . .	1 0 0
Bradburne, T. . . . .	Astwood Hill, Redditch . . . . .	1 0 0
Bradford, J. . . . .	Yeovil . . . . .	1 0 0
Bradford, Thos., and Co. . . . .	Salford, Manchester . . . . .	1 0 0
†Braikenridge, John Herman.	The Rookery, Chew Magna, Bristol . . . . .	..
Braikenridge, W. J. . . . .	Newton House, Clevedon, Somerset . . . . .	1 1 0
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†Brassey, H. L. C. . . . .	Preston Hall, Aylesford, Kent . . . . .	..
Brendon, G. . . . .	Broomhill, Stratton, North Devon . . . . .	1 0 0
Bristol Wagon Works Com- pany (Limited) . . . . .	Lawrence Hill, Bristol . . . . .	1 1 0

Name.	Residence.	Subscriptions.		
		£	s.	d.
nead, T. Palfrey . . . .	Enmore Park, Bridgwater . . . .	1	0	0
J. C. . . . .	High Ridge Farm, Dundry, Bristol	1	0	0
S. . . . .	Newhall, Broad Clyst, Exeter . . . .	1	0	0
man, F. D. . . . .	Beach Borough, Hythe, Kent. . . .	1	0	0
ip, E. . . . .	Cossington, Somerset . . . . .	1	0	0
, Sir B. V. S., Bart. . . .	Brookham Warren, Betchworth . . . .	1	0	0
and Co. . . . .	Salisbury . . . . .	1	0	0
, James . . . . .	Shepton Mallet . . . . .	1	0	0
, William Jeffery . . . .	Middlehill House, Box, Wilts . . . .	1	0	0
e, Solomon . . . . .	Barton, Landrake, Devonport . . . .	0	10	0
e, W. J. . . . .	Buckland Filleigh, Highampton . . . .	1	0	0
e, C. G. Prideaux . . . .	Prideaux Castle, Padstow . . . . .	1	0	0
n, J. . . . .	7, Princes Street, Yeovil . . . . .	1	0	0
t, Messrs. . . . .	St. Philip's Marsh, Bristol . . . . .	1	1	0
, J. P. . . . .	Bystock, near Exmouth . . . . .			
er, William E., M.P. . . .	Ilslington House, Dorchester . . . .			
A. . . . .	Worcester . . . . .	1	0	0
ingham, Rev. F. F. . . .	The Rectory, Doddiscombsleigh, Exeter . . . . .			
ingham, W. . . . .	Southernhay, Exeter . . . . .	1	0	0
ey, W. J. . . . .	Llanelly . . . . .	1	0	0
ell, B. . . . .	Holcombe Rogus, Wellington, Somerset . . . . .	1	0	0
H. A. . . . .	Shepton Mallet . . . . .	1	0	0
tt, W. E. . . . .	Stoke Bishop, near Bristol . . . . .	1	1	0
r, Admiral A. . . . .	Erle Hall, Plympton . . . . .			
l, John . . . . .	Pamflete, Ivybridge . . . . .	1	0	0
mbe, E. A. . . . .	Coombe Florey, Taunton . . . . .	1	0	0
lge, Charles . . . . .	Chitterne St. Mary, Codford, Wilts . . . .	1	0	0
lge, Edwin . . . . .	South Wraaxall, Bradford-on-Avon . . . .	1	0	0
lge, W. . . . .	Chippenham . . . . .	1	0	0
, William . . . . .	Stoke Farm, Charles, South Molton . . . .	0	10	0
rd, R. . . . .	Cattedown, Plymouth . . . . .	1	0	0
tt, J. . . . .	Island House, Highbridge . . . . .	1	0	0
ll, Sir C. R., Bart. . . .	Knepp Castle, Sussex . . . . .			
v, G. . . . .	Manor Farm, South Marston, Swindon . . . . .	1	1	0
B. . . . .	Manor Farm, Laverton, Bath . . . . .	1	0	0
R. H. . . . .	Ellaston, Atlantic Road South, Weston-super-Mare . . . . .	1	0	0
E. . . . .	Elphicks, Horsmonden, Kent . . . . .	1	0	0
ll, C. . . . .	Torquay . . . . .	1	0	0
er, G., & Co. . . . .	Bath . . . . .	1	0	0
, H. . . . .	1, Abbey Park, Keynsham . . . . .	1	0	0
worth, R. W. . . . .	Percy House, Kensington, Bath . . . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
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Campion, W. H. . . . .	Danney, Hassocks, Sussex. . . . .	1	0	0
Candy, T. C. . . . .	Woolcombe, Cattistock, Dorset . . . . .	1	0	0
Cannon, H. . . . .	Milton Clevedon, Evercreech . . . . .	1	0	0
Caple, J. . . . .	Beach Farm, Bitton, Gloucestershire . . . . .	1	0	0
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*Carew-Gibson, G. C. . . . .	Kingsfold, Billingshurst, Sussex. . . . .	2	0	0
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Carson and Toone . . . . .	Warminster . . . . .	1	0	0
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†Cartwright, F. F. . . . .	7, Percival Road, Clifton . . . . .			
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Cecil, Lord A. . . . .	Orchardmains, Tunbridge . . . . .	1	0	0
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†Chapman, C. . . . .	Carlecotes Hall, Dunford Bridge, near Sheffield . . . . .			
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Chapman, W. W. . . . .	Fitzalen House, Arundel Street, Strand, London . . . . .	1	0	0
Chard, T. T. . . . .	Dungarvan, Downleaze, Stoke Bishop . . . . .	1	1	0
Charles, W. . . . .	Breedy, Bridport . . . . .	1	0	0
Chichester, C. A. W. . . . .	Kenn, near Exeter . . . . .	1	0	0
Chick, John . . . . .	Compton Valence, Dorchester . . . . .	1	0	0
Chorley, W. L. . . . .	Quarme, Dunster, Somerset . . . . .	1	1	0
Chown, Richard . . . . .	Holcombe Farm, Exbridge, Tiverton . . . . .	0	10	0
Churchouse, A. . . . .	Westholme, Shepton Mallet . . . . .	1	0	0
Clark, Isaac . . . . .	West Lynch, Selworthy . . . . .	1	0	0
Clark, James . . . . .	Street, Glastonbury . . . . .	1	0	0
†Clark, J. J. . . . .	Goldstone Farm, West Brighton (Hon. Local Sec., 1885) . . . . .			

Name.	Residence.	Subscriptions.		
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ie, Joshua . . . . .	Minehead . . . . .	1	0	0
ake, T. E., Capt. . . . .	Alcombe Cote, Dunster . . . . .			
ie, W. . . . .	East Lynch, near Minehead, Somerset . . . . .	1	0	0
len, H. . . . .	Northoe, Park View, Hoddesdon Lincoln . . . . .	1	1	0
ton, Shuttleworth, and Co.	Berwick, Bridport . . . . .	2	2	0
l, S. . . . .	Sanctuary, Crediton, Devon . . . . .	1	0	0
e, B. C. . . . .	Sanctuary, Crediton, Devon . . . . .	1	1	0
e, W. C. . . . .	Sanctuary, Crediton, Devon . . . . .	1	1	0
, Edmund H. . . . .	Burford, Shepton Mallet . . . . .	1	0	0
ord, Lord . . . . .	Ugbrook, Chudleigh . . . . .			
L. E. . . . .	1, Holborn Place, High Holborn, London . . . . .	1	0	0
on, J. H. . . . .	Upland House, Keynsham, Bristol . . . . .	1	1	0
ton, Lord . . . . .	Heanton Satchville, Beaford, North Devon . . . . .	2	2	0
ier, Frederick . . . . .	Bristol Road, Weston-super-Mare . . . . .	0	10	0
, R. . . . .	Brome House, West Malling, Kent . . . . .	1	0	0
on, Henry . . . . .	Hartwood, Reigate . . . . .	1	0	0
on, John . . . . .	3, Sussex Sq., Hyde Park, London . . . . .	1	0	0
on, Robert Geo. . . . .	9, Whitehall Place, London . . . . .	0	10	0
on, R. W. . . . .	Doner's Lodge, Reigate . . . . .	1	0	0
as, S. B. . . . .	Stanton Drew Court, Pensford . . . . .	1	0	0
, H. M. . . . .	Higham, Kent . . . . .	1	0	0
, George . . . . .	12, South Street, South Molton . . . . .	0	10	0
ay and Sons . . . . .	Frome Selwood . . . . .	0	10	0
nan, W. T. . . . .	Langley Fitzurse, Chippenham . . . . .	1	0	0
T. . . . .	Gollege Farm, Wells, Somerset . . . . .	1	0	0
, C. and T. . . . .	Manor House, Winterbourne Stoke, Salisbury . . . . .	1	0	0
x, W. . . . .	Westmead, Bridport . . . . .	1	0	0
as, C. R. . . . .	Strathculm, Hele, Cullompton . . . . .	1	1	0
as, D. . . . .	Newton Ferrars, Carrington, Corn- wall . . . . .	1	0	0
an, J. J., M.P. . . . .	Carrow House, Norwich . . . . .	1	1	0
er, Jas. . . . .	Redland Knoll, Bristol . . . . .	1	1	0
ston, E., M.P. . . . .	Roundway Park, Devizes . . . . .	2	2	0
urst, Symons, and Co.	Bridgwater . . . . .	1	0	0
ibe, R. H. . . . .	Pierrepont, Farnham . . . . .	2	0	0
ibe, R. T. . . . .	Earnshill, Curry Rivell, Taunton . . . . .	2	0	0
y, Herbert F. . . . .	The Poplars, Pucklechurch, Bristol . . . . .	1	0	0
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kson, H. T. . . . .	Sturford Mead, Warminster . . . . .			
ng, G., and Son . . . . .	Northgate Street, Bath . . . . .	1	1	0
bs, G. . . . .	Radstock, near Bath . . . . .	1	0	0
bs, Joseph . . . . .	Radstock, Bath . . . . .	1	0	0
er, G. . . . .	Branscombe, Axminster . . . . .	0	10	0
er, G. H. . . . .	Huntspill, Bridgwater . . . . .	1	1	0
er, P. W. D. . . . .	99, Pembroke Road, Clifton . . . . .			
er, R. P. . . . .	Shenstone Court, Lichfield . . . . .			
tt, J. R. . . . .	More Place, Betchworth, Surrey . . . . .	1	0	0

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Name.	Residence.	Sub- scriptions.
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Cornish, H. J. . . . .	Thornford, Sherborne . . . . .	1 0 0
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†Cornwallis, F. S. W. . . . .	Linton Park, Maidstone . . . .	..
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Cotterell, W. . . . .	Derry Ormond Park, Cardigansh.	1 0 0
Cotton, Col., the Hon. R. S. . .	Somerford Hall, Brewood, Staffs.	1 0 0
Courtenay, Hon. H. L. . . . .	Fox, Fowler's Bank, Exeter . . .	1 0 0
†Coussmaker, Lieut.-Col. G. . .	Westwood, Guildford, Surrey . .	..
*Coventry, The Earl of . . . .	Croome Court, Severn Stoke, Worcestershire . . . . .	2 0 0
Cox, James . . . . .	High Littleton, Bath . . . . .	1 0 0
Crane, James . . . . .	Torpuddle, Dorchester . . . . .	1 0 0
Crawshay, W. T. . . . .	Cyfarthfa Castle, Merthyr Tydvil	1 0 0
Crick, Thomas . . . . .	Great Ash, Winsford, Dulverton	0 10 0
Crookes, J. W. . . . .	Scuttingham, Sittingbourne, Kent	1 0 0
Crutchley, P. E. . . . .	Limminghill Lodge, Ascot . . . .	1 0 0
Culverwell, Bros. . . . .	Durleigh Farm, Bridgwater . . .	1 0 0
Cuming, A. P. . . . .	Moreton Hampstead, Devon . . .	1 0 0
Cundall, H. M., F.S.A. . . . .	Richmond, Surrey . . . . .	1 0 0
Custance, Mrs. M. . . . .	Brook Heath, Breamore, Salisbury	1 0 0
Cutcliffe, G. . . . .	Coombe House, Witheridge, N. Devon . . . . .	1 0 0
Dairy Supply Company . . . . .	Museum St., Bloomsbury, London	1 0 0
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†Damer, Capt. G. Dawson . . . .	Came, Dorchester . . . . .	..
Damerel & Son . . . . .	161, Sidwell St., Exeter . . . .	1 0 0
Dampney, G. D. . . . .	Hinton, Ilchester . . . . .	1 0 0
Dancey, T. . . . .	Melksham . . . . .	1 0 0
Danger, Thomas . . . . .	Rowford Lodge, Taunton . . . .	1 0 0
Daniel, Rev. H. A. . . . .	Manor House, Stockland, Bridg- water . . . . .	1 0 0
†Daniel, H. T. . . . .	Manor House, Stockland, Bridg- water . . . . .	..
Daniel, Thos. C. . . . .	Stoodleigh, Tiverton . . . . .	1 1 0
Darby, A. E. W. . . . .	Little Ness, Shrewsbury . . . .	1 0 0
Darby, E. . . . .	Liscombe, Dulverton . . . . .	1 0 0
Darby, S. R. . . . .	Merafield, Martock, R.S.O. . . .	1 0 0
*Darnley, Earl of . . . . .	Cobham Hall, Gravesend . . . .	5 0 0
Daubeney, Lieut.-Col. . . . .	The Beacon, Kingswear, South Devon . . . . .	1 1 0
†Davenport, Rev. George . . . .	Foxley, Hereford . . . . .	..

Name.	Residence.	Subscriptions.		
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ay, J. Sydney . . . .	Brockym House, Helston, Cornwall	.	.	.
r, Sleep, and Co. . . .	Excelsior Plough Works, Plymouth . . . . .	1	0	0
r, T. . . . .	Beere Manor Farm, Cannington, Bridgwater . . . . .	1	0	0
s, J. N. . . . .	Gweleath, Cury, R.S.O., Cornwall	1	0	0
, Arthur J. . . . .	Farncombe Farm, Doulting, Shepton Mallet . . . . .	1	0	0
, F. C. . . . .	Frogmore, Moreton-in-Marsh . . . . .	1	0	0
, H. J. . . . .	Doulting, near Shepton Mallet . . . . .	1	0	0
y, W. . . . .	Tracy Park, Bath . . . . .	.	.	.
W. H. . . . .	Chelwood House, Pensford, near Bristol . . . . .	1	0	0
, R. R. M. . . . .	Spurbarne, Exeter . . . . .	1	0	0
on, Hon. R. . . . .	Holne Park, Ashburton. . . . .	1	0	0
on, W. and F. . . . .	Market Place, Bath . . . . .	1	0	0
John. . . . .	Huxham, E. Pennard, Shepton Mallet . . . . .	1	0	0
Son, and Hewitt . . . .	22, Dorset St., Baker St., London	.	.	.
on, W. A. . . . .	20, Birchin Lane, London, E.C.	.	.	.
S. . . . .	Newport, Mon. . . . .	1	0	0
aquiere, Lord . . . .	Woodborough House, Bath . . . . .	1	0	0
roke, Lord Willoughby	Compton Verney, Warwick . . . . .	.	.	.
etto, Col. . . . .	Brook Lodge, Holm Wood, Dorking, Surrey . . . . .	1	0	0
furrieta, A. . . . .	Wadhurst Park, Hawkhurst, Sussex . . . . .	.	.	.
r, R. . . . .	West of England Annato Works, Bishop's Sutton, Bristol . . . . .	1	1	0
r, Rev. Samuel . . . .	Lattiford House, Wincanton . . . . .	1	0	0
g, C., and Co. . . . .	Chard, Somerset . . . . .	1	0	0
on, Rev. Archdeacon . .	East Brent, Somerset . . . . .	1	1	0
y, The Earl of . . . .	Knowsley, Prescot . . . . .	.	.	.
itre, H. Denis . . . .	Charlton House, Wantage . . . . .	.	.	.
nshire, Duke of, K.G. . .	Chatsworth, Derbyshire . . . . .	5	0	0
ison, A. . . . .	Kingweston, Somerton, Somerset.	1	0	0
ison, W. . . . .	121, St. George's Square, Pimlico, London, S.W. . . . .	1	1	0
on's, Limited . . . .	Chester . . . . .	1	1	0
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, J. K. . . . .	Sherborne Castle, Sherborne . . . . .	1	0	0
, J. K. W. . . . .	Sherborne Castle, Sherborne . . . . .	1	0	0
, C. B. . . . .	Marwell Manor, Fair Oak, near Southampton . . . . .	1	0	0
, G., & Sons . . . .	Victoria St., Bristol . . . . .	1	0	0
gton, R. M. . . . .	Horsington House, Templecombe	1	1	0
swell, A. C. . . . .	Ripple Hall, Tewkesbury . . . . .	1	0	0
, F. . . . .	The Firs, Kington Langley, Chippenham . . . . .	1	0	0
T. C. . . . .	Care of J. E. Wakefield, Esq., Solicitor, Taunton . . . . .	1	0	0
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Name.	Residence.	Subscriptions.
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*Ducie, Earl of . . . . .	Tortworth Court, Falfield, R.S.O., Glos. . . . .	2 0 0
Duckering, C. E. . . . .	Whitehoe, Kirtton Lindsey. . . .	1 0 0
†Duckham, T. . . . .	Halmer, Hereford . . . . .	. . .
Duckworth, R. . . . .	The Cloisters, Bath . . . . .	1 0 0
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†Dunboyne, Lord . . . . .	Greendale, Clyst St. Mary, Exeter	. . .
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Dunn, William . . . . .	Frome . . . . .	1 0 0
†Durrant, Edward . . . . .	Tunbridge Wells (Hon. Local Sec. 1881) . . . . .	. . .
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Dyke, Thomas . . . . .	Long Ashton Lodge, Clifton, near Bristol . . . . .	1 0 0
*Dyke, Rt. Hon. Sir W. Hart, Bart., M.P. . . . .	Lullingstone Castle, Eynsford. .	2 2 0
†Dymond, Edward E. . . . .	Oaklands, Apsley Guise, Woburn	. . .
Dymond, Francis W. . . . .	Exeter . . . . .	1 0 0
Eames, T. P. . . . .	Cotley Farm, Chard. . . . .	0 10 0
Easton, Richard . . . . .	Heale Mount, Taunton. . . . .	1 0 0
Ebborn, F. C. . . . .	Northington Farm, Awre, Newn- ham, Gloucester . . . . .	0 10 0
†Edgcumbe, E. R. Pearce. . . .	Somerleigh, Dorchester . . . .	. . .
Edgington, Benjamin (Limited)	2, Duke Street, London Bridge .	1 0 0
†Edmondson, A. . . . .	Tubney Warren Farm, Abingdon	. . .
Edwards, C. L. Fry . . . . .	The Court, Axbridge, Somerset .	1 0 0
Edwards, A. P. . . . .	Hutton, Weston-super-Mare . . .	1 0 0
Edwards, Jas. . . . .	Belmont, Flax Bourton, nr. Bristol	1 0 0
†Egmont, Earl of . . . . .	Cowdray Park, Midhurst, Sussex	. . .
Eldridge, Pope and Co. . . . .	Dorchester. . . . .	1 0 0
*Ellesmere, Earl of . . . . .	Worsley Hall, Manchester. . . .	2 0 0
*Elliot, H. E. Tracey . . . . .	Leigham House, Plympton . . .	2 2 0
Elliott, F. M. . . . .	Biddestone, Chippenham . . . .	1 0 0
Ellis, E. . . . .	Summersbury Hall, Shalford, near Guildford . . . . .	1 0 0
Ellis, J. . . . .	Maidstone . . . . .	1 0 0
*Elton, Sir E., Bart. . . . .	Firwood, Clevedon . . . . .	2 2 0
Elwes, P. F. C. . . . .	Somerton, Somerset . . . . .	1 0 0
Elworthy, Charles . . . . .	Stone Farm, South Molton . . .	1 0 0
Enys, F. G. . . . .	Enys, Penryn, Cornwall . . . .	1 0 0
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Evans, Daniel . . . . .	Winsford, Dulverton . . . . .	0 10 0
Evans, David . . . . .	Llanfenneck Park, Llanelly . . .	1 0 0

Name.	Residence.	Subscriptions.		
		£	s.	d.
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3, F. . . . .	Langley Lodge, Chippenham . . . . .	1	0	0
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1-Thomas, Commander A.	Cae Rwnon, Builth . . . . .			
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ell, Capt. W. . . . .	The Priory, Burnham, Bucks. . . . .	1	0	0
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ch, C. H. M. . . . .	Salisbury . . . . .			
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Harbord, Rev. H. . . . .	East Hoathley Rectory, Hawk- hurst, Sussex . . . . .	1	0	0
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Name.	Residence.	Subscriptions.		
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ay, G. . . . .	Royal Prize Churn Works, Chippenham . . . . .	1	0	0
s, T. . . . .	Williton, Taunton . . . . .	1	0	0
ins, J. Heywood . . . . .	Bignor Park, Petworth. . . . .			
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J. . . . .	Dorchester . . . . .	1	0	0
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an, J. E. . . . .	Ecclesden Manor, Angmering, Arundel . . . . .	1	1	0
coat-Amory, Sir J. H., rt. . . . .	Tiverton, Devon . . . . .	2	2	0
coat-Amory, I. M. . . . .	Hensleigh, Tiverton, Devon . . . . .	1	0	0
ch, W. B. . . . .	Stratton, Ilminster . . . . .	1	0	0
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e, W. . . . .	Staplehurst . . . . .	2	0	0
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*Subscriptions.*

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Jefferis, W. H. . . . .	Hill End, Henbury, near Bristol . . . . .	1 0 0
Jenkin, S. W. . . . .	Liskeard, Cornwall . . . . .	0 10 0
*Jersey, Earl of . . . . .	Middleton Park, Bicester, Oxon . . . . .	2 0 0
Jeyes' Sanitary Compounds Company . . . . .	Cannon Street, London, E.C. . . . .	1 0 0
†Jonas, F. N. . . . .	Crishall Grange, Saffron-Walden . . . . .	. . .
†Jonas, George . . . . .	Ickleton, Saffron-Walden . . . . .	. . .
†Jones, Henry Parr . . . . .	Portway House, Warminster . . . . .	. . .
Jones, Major F. J. . . . .	Chippenham . . . . .	1 0 0
Jones, Winslow . . . . .	Exeter . . . . .	1 1 0
Keen, J. R. . . . .	Chewton Farm, Ston Easton, Bath . . . . .	1 0 0
Keene, James B. and Co. . . . .	<i>Journal</i> Office, Bath . . . . .	1 0 0
Keevil, C. . . . .	Blagdon Stud Farm, Malden, Surrey . . . . .	1 0 0
Keevil, J. V. . . . .	Shaw Farm, Melksham . . . . .	1 0 0
Kell and Co. . . . .	Gloucester . . . . .	1 0 0
Kemble, C. A. . . . .	Eastwood Manor, E. Harptree, Bristol . . . . .	1 0 0
Kemble, Henry . . . . .	Overtown, Swindon, Wilts . . . . .	1 0 0
†Kemp, L. J. . . . .	Maer Farm, Exmouth . . . . .	. . .
Kennaway, Sir J. H., Bart., M.P. . . . .	Escot, Ottery St. Mary. . . . .	1 1 0
Kennedy, D. . . . .	The Forbury, Reading . . . . .	1 0 0
†Kettlewell, W. W. . . . .	East Harptree Court, Bristol . . . . .	. . .
Kidner, Edwin . . . . .	Cothelstone Manor, Taunton . . . . .	1 0 0
Kidner, John . . . . .	Nynehead, near Wellington, Som. . . . .	1 0 0
Kidner, S. . . . .	Bickley Farm, Milverton, Somerset . . . . .	1 0 0
Killen, R. H. . . . .	Farrington Gurney, Bristol . . . . .	1 0 0
Kindersley, E. L. . . . .	Clyffe, Dorchester . . . . .	1 0 0
King, J. P. . . . .	North Stoke, Wallingford . . . . .	1 0 0
King, R. Moss . . . . .	Ashcott Park, Bridgwater . . . . .	1 0 0
King and Son, R. . . . .	Milsom Street, Bath . . . . .	1 0 0
King, Sir Wm. D. . . . .	Stratford Lodge, Southsea . . . . .	0 10 0

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Name.	Residence.	Sub- scriptions.
		£ s. d.
Kingscote, T. . . . .	The Trench, Tonbridge . . . . .	1 0 0
Kinneir, H. . . . .	Redville, Swindon . . . . .	1 0 0
Kirkham, W. . . . .	Banzley Farm, Tamworth . . . . .	1 0 0
Knapman, A. . . . .	Loxbeare, Tiverton . . . . .	0 10 0
Knatchbull, W. . . . .	Bodreau, Truro . . . . .	1 0 0
†Knight, Sir F. W., K.C.B. . . . .	Simonsbath, South Molton . . . . .	..
Knight, R. . . . .	Luccombe, Minehead . . . . .	1 0 0
Knightley, Rev. H. F. . . . .	Wasperton, Warwick . . . . .	1 0 0
†Knollys, C. R. . . . .	Fitzhead Court, Taunton . . . . .	..
†Kruise, W. . . . .	Leeds, near Maidstone . . . . .	..
†Lake, C. . . . .	Oakley, Higham, Kent . . . . .	..
Lakeman, Thos. . . . .	Brixham, Devon . . . . .	0 10 0
Lambert, G., M.P. . . . .	Spryton, North Devon . . . . .	1 1 0
Lamoreaux, G. . . . .	6, Bovingdon Villas, Plympton . . . . .	1 1 0
Lamport, Messrs. C. . . . .	Bindon House, Wellington . . . . .	1 0 0
Lance, C. E. . . . .	Stoke Court, Taunton . . . . .	1 0 0
Lane, A. P. . . . .	Plas Power, Wrexham . . . . .	1 1 0
Langley, B. W. . . . .	King's Lynn, Norfolk . . . . .	1 0 0
Langworthy, W. F. . . . .	Clevedon, Somerset . . . . .	1 0 0
Lankester and Co. . . . .	110, Southwark Street, London . . . . .	1 0 0
*Lansdowne, Marquis of . . . . .	Bowood, Calne . . . . .	2 0 0
Lanxon, W. . . . .	Lostwithiel, Cornwall . . . . .	1 0 0
Lascelles, Rev. E. . . . .	Newton St. Loe, Bristol . . . . .	1 0 0
†Latham, T. . . . .	Little Wittenham, Abingdon . . . . .	..
Laurie, A. P. . . . .	49, Beaumont Square, London, E. . . . .	1 0 0
Laurie, Colonel R. P., C.B. . . . .	55, Eaton Place, London . . . . .	1 0 0
*Laverton, W. H. . . . .	Leighton House, Westbury, Wilts . . . . .	2 0 0
Lawrence, J. H. H. . . . .	1, Lynwid Villas, Bath . . . . .	1 1 0
*Lawson, H. G., M.P. . . . .	Taplow, Bucks . . . . .	2 0 0
Lear, Henry . . . . .	Copse Grove Farm, Lypiatt Park, Stroud, near Bisley, Gloucestershire . . . . .	1 0 0
Le Brocq, Francis . . . . .	St. Peter's, Jersey . . . . .	1 0 0
*Leconfield, Lord . . . . .	Petworth, Sussex . . . . .	2 0 0
Lee, Major-Gen. H. H. . . . .	The Mount, Dinas Powis, near Cardiff . . . . .	1 0 0
Lees, Elliott . . . . .	South Lychett Manor, Poole, Dorset . . . . .	1 1 0
Legg, E. Gapper . . . . .	Melplash Court, Melplash, Dorset . . . . .	1 0 0
Legg, Job . . . . .	Bridport, Dorset . . . . .	1 1 0
Leir, Lt.-Col. W. . . . .	Combe Head, Bampton, N. Devon . . . . .	1 0 0
Leney, H. . . . .	Court Lodge, West Farleigh, Kent . . . . .	1 1 0
*Lennard, Col. Sir J. Farnaby, Bart. . . . .	Wickham Court, West Wickham, Kent . . . . .	3 0 0
Lethbridge, Charles . . . . .	Sherfield Manor, Basingstoke . . . . .	1 0 0

Name.	Residence.	Subscriptions.		
		£	s.	d.
bridge, J. C. Baron . . . . .	Tregeare, Launceston . . . . .	2	0	0
bridge, W. . . . .	Courtlands, Lymptone . . . . .	0	10	0
ton, W. . . . .	Woolleigh Barton, Beaford, North Devon . . . . .	1	0	0
, Geo. . . . .	Ercall Park, Wellington, Salop . . . . .	1	1	0
, James . . . . .	Plasdraw, Aberdare . . . . .	1	0	0
, Wm. and Son . . . . .	Herald Office, Bath . . . . .	1	0	0
John Henry . . . . .	Trehill, Exeter . . . . .			
and, C. J. . . . .	Haggerston Castle, Beal, North-umberland . . . . .	1	0	0
n, E., M.D. . . . .	Silver Street House, Taunton . . . . .	1	1	0
ncott, R. Cann. . . . .	Over Court, near Bristol . . . . .	1	0	0
omb, G. . . . .	Frogholt, Hythe, Kent . . . . .	1	0	0
urne, Earl of . . . . .	Crosswood, Aberystwith, S. Wales . . . . .			
er, J. J. . . . .	Warninglid Grange, Haywards Heath . . . . .	1	1	0
, R. A., and Co. . . . .	Dursley, Gloucestershire . . . . .	1	0	0
gattock, Baron . . . . .	The Hendre, Monmouth . . . . .	1	1	0
llyn, Evan H. . . . .	Langford Court, Langford, Bristol . . . . .	1	0	0
llyn, W. J. . . . .	Southwood, Tiverton . . . . .	2	2	0
elyn, Sir J. T. D., Bart. . . . .	Penllergare, Swansea . . . . .	1	1	0
, Herbert . . . . .	Plas Cilybebyll, Swansea . . . . .	1	0	0
, J. B. . . . .	Wilmington Hall, near Dartford . . . . .	1	0	0
, J. C. . . . .	Saltford, near Bristol . . . . .	1	0	0
, A. C. E. . . . .	Northmoor, Dulverton . . . . .	1	0	0
, R. G. E. . . . .	Hartlip, nr. Sittingbourne, Kent. . . . .	1	0	0
esborough, Earl of . . . . .	Londesborough Park, Market Weighton . . . . .	1	0	0
J. . . . .	Stanbridge Hall, Romsey, Hants. . . . .	1	0	0
ig, Walter H., M.P. . . . .	Rood Ashton, Trowbridge . . . . .	1	0	0
Col. William . . . . .	Woodlands, Congresbury, Somerset . . . . .	1	0	0
G. . . . .	Ogbourne St. Andrew, Marlborough . . . . .	1	0	0
E. . . . .	East Chinnock, Yeovil . . . . .	1	0	0
G. . . . .	Sutton, Evercreech, Bath . . . . .	2	0	0
s, Sir M., Bart. . . . .	Maristow, Roborough, Devon . . . . .	1	0	0
, H. Y. Buller . . . . .	Maristow, Roborough, Plymouth. . . . .	1	0	0
, E. Q. . . . .	Langport . . . . .	0	10	0
ice, Amos . . . . .	Winsford, Dulverton . . . . .	1	0	0
ice, Earl of . . . . .	Horsley Towers, Leatherhead . . . . .			
ock, Sir John, Bart., M.P. . . . .	High Elms, Hayes, Kent . . . . .			
ngton, E. H. . . . .	Treasurer's House, Guy's Hospital, London . . . . .	1	0	0
ey, J. B. . . . .	Brockampton, Worcester . . . . .	1	0	0
ll, Rev. A. H. F. . . . .	Minchhead, Bridgwater . . . . .	1	0	0
ll, G. F. . . . .	Dunster Castle, Somerset . . . . .	1	0	0

andrew, J. J. . . . . Lukesland, Ivybridge . . . . . 2 0 0  
 nzie, Lewis . . . . . Tiverton, Devon . . . . . 1 0 0

Name.	Residence.	Sub- scriptions.
		£ s. d.
Macleay, Col. A. C. . . . .	Glasshayes, Lyndhurst. . . . .	1 0 0
Major, H. J., and C. (Limited)	Bridgwater . . . . .	1 0 0
Mallock, Richard, M.P. . . .	Cockington, Torquay . . . . .	1 0 0
Manfield, J. . . . .	Hambridge, Curry Rivell, Taunton	1 1 0
†Mansell, A. E. . . . .	Astol, Shifnal, Salop . . . . .	..
Marker, Richard . . . . .	Combe, near Honiton . . . . .	1 0 0
Marshall, Sons, and Co. . . .	Britannia Iron Works, Gains- boro' . . . . .	1 1 0
Marsh, W. S. . . . .	Pen-y-bedd, Pembrey . . . . .	1 0 0
Marsh, Son and Gibbs . . . .	Box, Wilts. . . . .	1 0 0
Martin, Christopher . . . . .	Broad Clyst, Exeter . . . . .	0 10 0
†Martin, G. E. . . . .	Ham Court, Upton-on-Severn . . .	..
Martin, H. . . . .	Smallcombe Farm, Bath . . . . .	1 0 0
Martin, Sydney J. . . . .	Whaddon Farm, Lamyat, Bath . .	1 0 0
Martyn, G. . . . .	Managing Director, Western Coun- ties Agricultural Co-operative Association, Plymouth . . . . .	1 0 0
Mason, A. . . . .	North Hill, Swansea . . . . .	1 0 0
*Mason, J. . . . .	Eynsham Hall, Oxon . . . . .	2 0 0
Mathews, Ernest . . . . .	Chequers Mead, Potters' Bar . . .	1 0 0
Matthews, A. T. . . . .	Lingfield, Surrey . . . . .	1 0 0
Maule, M. St. John . . . . .	Chapel House, Bath . . . . .	1 0 0
May, A. C. . . . .	Park House, Cotham Park, Bristol	1 0 0
May, W. J. . . . .	Farleigh Farm, Tiverton . . . . .	1 0 0
†Mayo, Henry . . . . .	4, Temple Terrace, Dorchester . .	..
†Mayo, John . . . . .	Wavey House, Upwey, Dorchester	..
McMurtrie, J. . . . .	Southill, Radstock, near Bath . .	1 0 0
Meade, F. . . . .	Langport, Somerset . . . . .	1 0 0
Medland, R. . . . .	Penstone, Cullompton . . . . .	1 0 0
Medland, W. R. . . . .	Yard Farm, Silverton, Cullompton	0 10 0
Medlicott, Henry E. . . . .	Potterne, Devizes . . . . .	1 0 0
Meek, A. Grant . . . . .	Hillworth, Devizes . . . . .	1 0 0
Merry, Richard . . . . .	Goulds, Broad Clyst, Exeter . . .	0 10 0
Merry, W. F. . . . .	Ash Clist, Broadclift, Exeter . . .	1 0 0
Merson, Thomas . . . . .	Holcombe Rogus, Wellington, Somerset . . . . .	0 10 0
Methuen, Major-Genl. Lord, C.B., C.M.G. . . . .	Corsham Court, Wilts . . . . .	1 0 0
Micklem, H. . . . .	Wiltshire Farm, Wokingham . . .	1 0 0
Middleton, Hastings N. . . . .	Bradford Peverell, Dorchester . .	1 0 0
Middleton, H. B. . . . .	Bradford Peverell, Dorchester . .	1 0 0
Mildmay, Capt. C. B. St. J. . .	Hallam, Dulverton . . . . .	1 0 0
Mildmay, Rev. A. St. J. . . .	Hazlegrove, Sparkford, Bath . . .	1 1 0
*†Mildmay, Sir H. St. John, Bart. . . . .	Dogmersfield Park, Hartford Bridge, Winchfield . . . . .	..
Mildon, W. B. . . . .	Sussex House, Wellington, Somerset . . . . .	0 10 0
†Mildred, G. B. . . . .	Butleigh, Glastonbury . . . . .	..
Miles, A. . . . .	Winchcombe Street, Chelten- ham . . . . .	1 0 0
†Miles, H. R. . . . .	Abbots Leigh, Clifton, Bristol . .	..
Millard, H. . . . .	Shrivenham, Berks . . . . .	1 0 0

# Subscriptions.

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Name.	Residence.	Subscriptions.		
		£	s.	d.
A. . . . .	Efford Down, Bude Haven, Cornwall . . . . .	1	0	0
n, T. S. . . . .	Montford, Shropshire, R.S.O. . . . .	1	0	0
nell, F. J. . . . .	Llanfreckfa Grange, Carleon, Mon. . . . .			
, A. G. D. . . . .	Warner, Bath . . . . .	1	1	0
Bretton, Lord. . . . .	8, Seamore Place, London. . . . .	1	1	0
C. J. . . . .	5, Buckingham Gate, London, S.W. . . . .	1	0	0
gu, Lord . . . . .	Palace House, Beaulieu, Hants . . . . .	1	0	0
fiore, Sir F., Bart. . . . .	Worth Park, Crawley . . . . .	1	1	0
, C. . . . .	Pylle, Shepton Mallet . . . . .	1	0	0
e, H. F. . . . .	Elderslie, Baronsfield Road, St. Margaret's, Twickenham . . . . .			
e-Stevens, J. C. . . . .	Winscott, Gt. Torrington, Devon . . . . .	5	0	0
ton, Lord . . . . .	Sarsden House, Chipping Norton . . . . .	2	2	0
n-Richardson, C. . . . .	Noyadd Wilym, Cardigan . . . . .	1	0	0
ad, Charles W. . . . .	Elmscroft, West Farleigh, Maidstone . . . . .	1	1	0
ey, Earl of . . . . .	Saltram, Plympton, Devon . . . . .	2	0	0
ell, G. Herbert . . . . .	Headington Hill Hall, Oxford . . . . .	2	2	0
s and Griffin (Limited)	Maindee, Newport, Mon. . . . .	1	1	0
ison, Alfred . . . . .	Fonthill House, Tisbury . . . . .			
nt-Edgecumbe, Earl of . . . . .	Mount-Edgecumbe, Devonport . . . . .	2	2	0
nt, G. W. . . . .	Wasing Place, Reading . . . . .			
stevens, J. . . . .	Railway Hotel, Yatton . . . . .	1	0	0
sey, H. G. . . . .	Bathealton Court, Wiveliscombe, Somerset . . . . .	2	2	0
slow, E. . . . .	Castlehead Grange, Lancashire . . . . .			
slow, E., jun. . . . .	Bury, Lancashire . . . . .			
, W. . . . .	Bruton, Somerset . . . . .	1	1	0
as, T. . . . .	Aberfeldy, The Shrubbery, West-on-super-Mare . . . . .	1	0	0
, P. A., M.P. . . . .	Dunsmore, near Rugby . . . . .	1	0	0
sh, Jeroni . . . . .	Cranwells, Bath (Mayor, 1864-6, 1876-8, 1887, 1891-3) . . . . .	2	0	0
y-Anderdon, H. Edward	Henlade House, Taunton . . . . .	1	1	0
leton, Thomas . . . . .	Beckjay, Ashton-on-Clun . . . . .	1	0	0
/				
, Col. W. D. . . . .	Stanley Lodge, Exmouth . . . . .	1	0	0
r, A. . . . .	Park Street, Taunton . . . . .	1	0	0
r, H. B. . . . .	Chippenhams . . . . .	1	1	0
	Lee Farm, Wisboro' Green, Billingshurst, Sussex . . . . .	1	1	0
r, G. . . . .	Macknade, Faversham . . . . .	1	1	0
e, F. . . . .	Grittleton, Chippenhams . . . . .	1	0	0
, Sir A. W., Bart. . . . .				

Name.	Residence.	Sub-
		scriptions.
		£ s. d.
Nelder, C. W. . . . .	Carnarvon Arms, Dulverton, Somerset. . . . .	0 10 0
†Neville-Grenville, Robert . . . . .	Butleigh Court, Glastonbury . . . . .	..
Newbery, Samuel P. . . . .	Plympton St. Mary, Devon . . . . .	1 0 0
Newnes, G., M.P. . . . .	Hesketh House, Torquay . . . . .	1 0 0
Newton, F. M. . . . .	Barton Grange, Taunton . . . . .	1 0 0
Newton, F. W. . . . .	Barton Grange, Taunton . . . . .	1 0 0
†Newton, J. G. . . . .	Millaton House, Bridestowe, Oke- hampton . . . . .	..
Nicholets, J. T. . . . .	Manor House, Brent Knoll, Bridgwater . . . . .	1 0 0
Nichols, George . . . . .	Broad Street, Bristol . . . . .	1 1 0
Nix, Mrs. S. . . . .	Tilgate, Crawley, Sussex . . . . .	1 0 0
Nock, E. . . . .	Brockton House, Shifnal, Salop . . . . .	1 0 0
Noel, Capt. G. T. . . . .	East Hayes, Shaftesbury . . . . .	1 0 0
*Normanton, Earl of . . . . .	Somerley, Ringwood, Hants . . . . .	2 0 0
Norris, Charles . . . . .	Mosshayne, Clyst, near Exeter . . . . .	1 0 0
Norrish, Thomas . . . . .	Churchill Farm, Loxbeare, Tiverton . . . . .	0 10 0
Northcote, Hon. Sir S. H., Bart., M.P. . . . .	7, Seamore Place, Mayfair, London . . . . .	1 0 0
*Northumberland, Duke of . . . . .	Albury Park, Surrey . . . . .	5 0 0
Nuttall, Joseph . . . . .	19, Longfield, Heywood, Lanca- shire . . . . .	1 0 0
Oken, Col. U. P. . . . .	Turnworth, Blandford . . . . .	1 0 0
Olde, J. C. . . . .	Grove, Launcells, Holsworthy . . . . .	0 10 0
Oliver-Bellasis, Captain . . . . .	Shilton House, Coventry . . . . .	1 1 0
*Onslow, Earl of, G.C.M.G. . . . .	Clandon Park, Guildford . . . . .	2 0 0
Ozanne, A. T. . . . .	Putron, Guernsey . . . . .	1 0 0
Page, Henry . . . . .	Walmer Court, Walmer . . . . .	1 1 0
Paget, L. C. . . . .	Amerdown, Radstock . . . . .	1 0 0
*Paget, Col. Sir R.H., Bt., M.P. . . . .	Cranmore Hall, Shepton Mallet . . . . .	2 0 0
Pain, Charles . . . . .	Longstock, Stockbridge, Hants . . . . .	1 1 0
Palairat, H. H. . . . .	Cattistock Lodge, Dorchester . . . . .	1 1 0
Palfreman, L. . . . .	Ingrams Farm, Loxbeare, Tiverton . . . . .	0 10 0
Palmer, Geo. . . . .	Marlston House, Newbury, Berks . . . . .	1 0 0
Palmer, G. W. . . . .	Elmhurst, Reading . . . . .	1 0 0
†Palmer, R. . . . .	Lodge Farm, Nazeing, Waltham Cross . . . . .	..
Parfitt, J. . . . .	Selwood Dairy, Frome . . . . .	1 0 0
Parker, Admiral . . . . .	Delamore House, Ivybridge . . . . .	1 0 0
†Parker, Hon. Cecil J. . . . .	Eaton Estate Office, Eccleston, Chester . . . . .	..

Name.	Residence.	Subscriptions.		
		£	s.	d.
H. C. G.. . . .	Alcester Park Farm, Warwickshire . . . . .	1	0	0
T. . . . .	High Street, Shepton Mallet . . . . .	1	0	0
Paxton William . . . . .	3, Major Terrace, Seaton, Devon . . . . .	1	0	0
iter, Wm. . . . .	The Axe, Crewkerne . . . . .	1	1	0
I, T. P. . . . .	Wrington, R.S.O., Somerset . . . . .	1	0	0
gton, M. B. . . . .	Holborough Cottage, Rochester . . . . .	1	0	0
Major J. H. . . . .	Bampton, North Devon. . . . .	1	0	0
T. . . . .	Newport, Mon. . . . .	1	0	0
ons, Henry . . . . .	Misterton, Crewkerne . . . . .	1	0	0
lge, S. J. . . . .	Selworthy, Taunton . . . . .	1	0	0
rk, E. . . . .	14, Union Street, Bath . . . . .	1	0	0
Edw. L. . . . .	The Dairy, Melton Constable, East Dereham, Norfolk . . . . .	1	0	0
um-Clinton-Hope, Lord F. H. . . . .	The Deepdene, Dorking . . . . .	2	0	0
er, G. H. . . . .	Tangier Park, Basingstoke . . . . .	1	0	0
roke, Earl of. . . . .	Wilton House, Salisbury . . . . .	2	0	0
rves, W. Cole . . . . .	Pendarves, Camborne, Cornwall . . . . .	1	1	0
; Thomas . . . . .	Taunton . . . . .	1	0	0
al, E. A. . . . .	Severn House, Henbury . . . . .	1	1	0
y-Herrick, Mrs. . . . .	Beau Manor Park, Loughborough . . . . .	1	1	0
s, Wm. Parsons . . . . .	North Cadbury, Bath . . . . .	1	0	0
rick, R. . . . .	Acland Barton, Landkey, Barnstaple . . . . .	0	10	0
r, J. McLeod . . . . .	Greenhouse, Bridgnorth . . . . .	1	1	0
fer, T. Valentine, R.C.V.S.L. . . . .	Crudwell, Malmesbury . . . . .	1	1	0
Capt. . . . .	Pendoggett, Timsbury, near Bath . . . . .	1	1	0
ips, C. D. . . . .	Newport, Monmouth . . . . .	1	0	0
s, C. N. P. . . . .	Chalcot, Westbury . . . . .	1	0	0
s-Hornby, Capt. G. S. . . . .	Sandley House, Gillingham, Bath . . . . .	1	0	0
ix Oil Mills Co. . . . .	Norfolk Street, Liverpool . . . . .	1	0	0
ey, Sims, and Co., Lmtd. . . . .	Bedford Foundry, Leigh . . . . .	1	0	0
it Brothers and Co. . . . .	59, Bishopsgate Street Without, London . . . . .	1	0	0
; Cecil S. . . . .	Weston-super-Mare . . . . .	1	0	0
ney, Erylsman C. . . . .	Berwick St. James, Salisbury . . . . .	1	0	0
y, F. . . . .	The Grange, Somerton, Somerset . . . . .	1	0	0
ey, R. W. . . . .	Somerton, Somerset . . . . .	1	0	0
ey, W. . . . .	Somerton, Somerset . . . . .	1	0	0
ck, W. . . . .	Littleworth House, Wantage . . . . .	1	1	0
Thomas, jun. . . . .	Southside Street, Plymouth . . . . .	1	0	0
k, J. W. . . . .	Twigworth Farm, Gloucester . . . . .	1	0	0
more, Lord . . . . .	Poltimore Park, Exeter. . . . .	3	3	0
ele, Thos. R. . . . .	Polwhele, Truro . . . . .	1	1	0
S. . . . .	Blandford, Dorset . . . . .	1	0	0
ord, T. . . . .	Minehead, Somerset . . . . .	1	0	0
r, E. . . . .	9, 10 and 11, Queen Square, Bath . . . . .	1	0	0
A. R. . . . .	12, Chester Place, Hyde Park Square, London, W. . . . .	1	0	0
Alfred . . . . .	Dorchester . . . . .	1	0	0



Name.	Residence.	Sub-
		scriptions.
		£ s. d.
Pope, Henry . . . . .	Cotleigh Court, near Honiton, Devon . . . . .	1 0 0
Pope, John . . . . .	The Shrubbery, Barnfield, Exeter . . . . .	1 0 0
†Pope, Rev. W. J. P. . . . .	Godmanstone Rectory, Dorchester . . . . .	..
Porch, J. A. . . . .	Edgarley, Glastonbury . . . . .	1 0 0
*Portal, Melville . . . . .	Laverstoke House, Micheldever . . . . .	2 0 0
Portal, Wyndham . . . . .	Malshanger, Basingstoke . . . . .	1 0 0
†Porter, R. . . . .	Denewood, Broadlands Road, Highgate, London, N. . . . .	..
†Portman, Hon. C. B. . . . .	Child-Okeford, Blandford, Dorset . . . . .	..
†Portman, E. W. D. . . . .	Durweston, Blandford . . . . .	..
*Portman, Viscount . . . . .	Bryanston, Blandford . . . . .	5 0 0
Potter, F. P. . . . .	Gate Works, King's Lynn . . . . .	1 0 0
Poulett, The Earl . . . . .	Hinton St. George, Crewkerne . . . . .	1 0 0
Powell, R. H. . . . .	Lewes, Sussex . . . . .	1 0 0
Powell, W. S. . . . .	Eglwysnunyd, Taibach . . . . .	1 0 0
*Poynder, Sir J. Dickson, Bart., M.P. . . . .	Hartham Park, Corsham . . . . .	2 0 0
Pratt, Chas. . . . .	Wescot, Tallaton, Ottery St. Mary . . . . .	1 0 0
Pratt, J. D. . . . .	Pratts Hayes, Exmouth . . . . .	1 0 0
Price, J. W. . . . .	Newport Pottery Co., Newport, Mon. . . . .	1 0 0
*Prior, R. C. A. . . . .	Halse House, near Taunton . . . . .	2 0 0
Proctor and Ryland. . . . .	Carr's Lane, Birmingham . . . . .	1 0 0
Proctor, H. and T. . . . .	Cathay, Bristol . . . . .	1 1 0
Pulley, J. . . . .	Lower Eaton, near Hereford . . . . .	1 0 0
†Purgold, A. . . . .	Linnet Lane, Liverpool . . . . .	..
Quibell Bros. . . . .	Newark . . . . .	1 0 0
Quicke, Rev. C. P. . . . .	The Rectory, Ashbrittle, Wel- lington . . . . .	1 0 0
Radmore, Henry T. . . . .	Court Barton, Thorverton, Devon . . . . .	1 0 0
Radway, C. W. . . . .	Bath . . . . .	1 1 0
*Ramsden, J. C. . . . .	Busbridge Hall, Godalming . . . . .	2 0 0
Randall, R. . . . .	Wolverton House, Clifton Down, Bristol . . . . .	1 0 0
Ransome, James Edward . . . . .	Orwell Works, Ipswich . . . . .	1 1 0
Rashleigh, Jonathan . . . . .	Menabilly, Par Station, Cornwall . . . . .	1 0 0
Rawlence, Ernest A. . . . .	Newlands, Salisbury. . . . .	1 0 0
Rawlence, James . . . . .	Bulbridge, Wilton, Salisbury . . . . .	1 1 0
Read, B. . . . .	New Barn Farm, Keynsham . . . . .	1 0 0
Read, J. K. . . . .	Berwick Farm, Hindon, Salisbury . . . . .	1 0 0
Reakes, P. . . . .	Hill House, Lipyeate, Holcombe, Bath . . . . .	1 0 0
Rees, W. J. . . . .	Swansea . . . . .	1 0 0
Rees-Stokes, C. W. . . . .	Town Clerk, Tenby . . . . .	1 1 0
Reeves, Robert and John, and Son . . . . .	Bratton Iron Works, Westbury, Wilts . . . . .	1 0 0

Name.	Residence.	Subscriptions.		
		£	s.	d.
. . . . .	Livingshayes, Silvertown . . . .	1	0	0
V. A. . . . .	Spring Grove, Milverton . . . .	1	0	0
g, Robert . . . . .	Catel Farm, Guernsey . . . . .			
oud and Gordon, Duke . . . . .	Goodwood, Chichester . . . . .	5	0	0
rd, Silas . . . . .	Newlyn East, Grampound Road, Cornwall . . . . .	1	0	0
James . . . . .	Blackford, Selworthy, Minehead . . . . .	1	0	0
T. K. . . . .	Minehead, Taunton . . . . .	1	0	0
T. . . . .	Sutton Weaver, via Warrington, Cheshire . . . . .	1	0	0
, Henry . . . . .	Lyminge, Hythe, Kent . . . . .	1	0	0
, Gen. Fox Pitt. . . . .	Rushmore Lodge, Ludwick, Salis- bury . . . . .	2	0	0
tes, Lord . . . . .	Lanhydroc, Bodmin . . . . .	2	0	0
s, J. D. Cramer . . . . .	Highfield, Frant, Tunbr. Wells . . . . .	1	1	0
s, J., and Son . . . . .	Bridgwater . . . . .	1	1	0
, J. . . . .	High Bray, South Molton . . . . .	0	10	0
on, S. . . . .	Lynhales, Kington, Herefordshire . . . . .	1	0	0
on, John, and Co. . . . .	Bristol . . . . .	1	1	0
on, W. J. . . . .	Yatton Keynell, Chippenham . . . . .	1	1	0
ck, W. Buckley . . . . .	Llanelly . . . . .	1	0	0
r, James . . . . .	West Town, R.S.O., near Bristol . . . . .	1	0	0
hild, Lord . . . . .	Tring Park, Herts . . . . .	1	0	0
ie, E. L. . . . .	Hall Place, Cranleigh, Guildford . . . . .	1	0	0
Guernsey Agricultural Horticultural Society . . . . .	Guernsey . . . . .	1	0	0
H. . . . .	Todenham, Moreton-in-Marsh . . . . .	1	0	0
in, H. J. . . . .	West Street Schools, Bridgwater . . . . .	1	0	0
L. H. . . . .	Sherborne . . . . .	0	10	0
G. S. . . . .	Greenhill Farm, Sutton Veney, Warminster . . . . .	1	0	0
T. S. . . . .	Upton Lovell, Corton, Bath . . . . .	1	0	0
and Proctor . . . . .	Sheaf Iron Works, Lincoln . . . . .	1	0	0
C. . . . .	North Cadbury, Bath . . . . .	1	0	0
d, H. P. . . . .	Wishaw Hall, Erdington . . . . .			
l, P. . . . .	Buchan Hill, Crawley, Sussex . . . . .	1	0	0
ary, T. H. . . . .	Beckington Rectory, Bath . . . . .	1	0	0
Germans, Earl of . . . . .	Port Elliott, St. Germans, R.S.O. Cornwall . . . . .	3	3	0
ur, Lord P. . . . .	Maiden Bradley, Bath . . . . .	1	0	0
l, H. C. . . . .	North Fields, Bridgwater . . . . .	1	0	0
l, W. . . . .	Yonder Broadpool Farm, Dou- ling, Shepton Mallet . . . . .	1	0	0
Benjamin . . . . .	Newlands, Broad Clyst, Exeter . . . . .	1	0	0
son, Sir B., Bart., M.P. . . . .	Banbury . . . . .	1	0	0
ison, Ernest . . . . .	Bodicote Grange, Banbury . . . . .	1	0	0
son and Co. . . . .	Britannia Works, Banbury . . . . .	1	0	0
s, E. A. . . . .	Stoke House, Exeter . . . . .	1	0	0

Name.	Residence.	Subscriptions.
		£ s. d.
†Sanders, E. J. . . . .	Stoke House, Exeter . . . . .	1 0 0
Sanders, Rev. L. . . . .	Rectory, Whimpe, Devon . . . . .	1 0 0
Sandford, R., and Son . . . . .	Torr ridge Vale Dairy, Torrington, Devon . . . . .	1 0 0
Sandvey, H. Poole . . . . .	Launcells, Holsworthy . . . . .	0 10 0
Sanford, E. C. A. . . . .	Nynehead, Wellington, Somerset . . . . .	1 1 0
Sanford, W. A. . . . .	Nynehead, Wellington, Somerset . . . . .	1 0 0
Saunders, C. M. . . . .	Boracott, Brandiscorner, N. Devon . . . . .	1 0 0
Saunders, J. . . . .	Sutton, Cranborne, Dorset . . . . .	1 0 0
Savidge, M. . . . .	Saidsden Lodge Farm, Chipping Norton . . . . .	1 1 0
Savile, Col. H. B. O. . . . .	4, Rodney Place, Clifton . . . . .	1 1 0
Scanes, H. J. . . . .	West Wood, Broad Clyst, Exeter . . . . .	0 10 0
*Scobell, Col. Barton L. J. . . . .	Kingwell Hall, High Littleton, near Bristol . . . . .	2 2 0
Scott-Hall, H. . . . .	Dormington Court, Hereford . . . . .	1 0 0
†Scott, T. . . . .	Ditton Court, Maidstone . . . . .	..
*Scratton, D. R. . . . .	Ogwell, Newton Abbott . . . . .	2 2 0
Search, Miss B. . . . .	Cowie, Stonehaven, N.B. . . . .	1 0 0
†Seaton, Lord . . . . .	Nutwell Court, Lympstone, Devon . . . . .	..
Senior, H. . . . .	Rushton, Blandford, Dorset . . . . .	1 0 0
Seward, Samuel N. . . . .	Weston, near Petersfield, Hants . . . . .	1 0 0
†Seymour, R. A. H. . . . .	46, Earl Street, Maidstone (Hon. Local Sec., 1884) . . . . .	..
Shackell, R. . . . .	Lower Swainswick House, Bath . . . . .	1 0 0
Shakerley, H. W. . . . .	Embley Park, Romsey, Hants . . . . .	1 0 0
Shaw, Rev. G. F. E. . . . .	Edgworth Rectory, Cirencester . . . . .	1 0 0
†Shaw-Stewart, Walter R. . . . .	Berwick House, Hindon, Salis- bury . . . . .	..
Shears, W. . . . .	Lee Farm, Pyrford, Woking Station . . . . .	1 0 0
Shelley, Sir John, Bart. . . . .	Shobrooke Park, Crediton . . . . .	1 1 0
Sheppy, J. . . . .	Iwoods House, Congresbury, Bristol . . . . .	1 0 0
†Sherston, Major C. D. . . . .	Driscoc House, Bruton, Bath . . . . .	..
Sherston, Capt. J. D. . . . .	Evercreech, Bath . . . . .	1 0 0
†Sherston, T. P. D. . . . .	Evercreech, Bath . . . . .	..
Shore, J. H. . . . .	Whatley House, Frome . . . . .	1 0 0
Sillifant, A. O. . . . .	Coombe House, Copplestone, N. Devon . . . . .	1 0 0
Sim, W. C. . . . .	Knowle, Clyst St. George, Top- sham . . . . .	1 1 0
Simmons, Chas. John . . . . .	Langford, Somerset . . . . .	1 1 0
†Simmons, Henry . . . . .	Bearwood Farm, Wokingham . . . . .	..
Simpson, F. C. . . . .	Maypool, Churston Ferrars, R.S.O., S. Devon . . . . .	1 0 0
*Simpson, Geo. . . . .	Wray Park, Reigate . . . . .	2 2 0
*†Singer, A. M. . . . .	Redworth, near Totnes . . . . .	..
Singer, John J. . . . .	Belcombe Farm, Bradford-on- Avon . . . . .	0 10 0
*Singer, W. M. G. . . . .	Streatfield, Paignton, Devon . . . . .	5 0 0
Skinner, A. . . . .	Bratton Fleming, Barnstaple . . . . .	0 10 0

Name.	Residence.	Subscriptions.		
		£	s.	d.
, A. C. . . . .	Pound Farm, Bishop's Lydeard, Taunton . . . . .	1	0	0
, Henry Duncan . . .	Claverton Manor, Bath . . . . .	2	0	0
H. M. . . . .	Warleigh Manor, Bath . . . . .	1	1	0
A. H. . . . .	Stock Exchange, London, E.C. . . . .	1	0	0
, A. . . . .	Gloucester Carriage Works, Gloucester . . . . .	2	2	0
G. E. . . . .	Combe Hay Manor, Bath . . . . .	1	0	0
, Hon. W. F. D., M.P.	Greenlands, Henley-on-Thames . . . . .	5	0	0
H. J. . . . .	Stoke Abbott, Beaminster, Dorset . . . . .	1	0	0
Hugh C. . . . .	Mount Clare, Roehampton . . . . .	1	1	0
, J. W. . . . .	Thinghill Court, Hereford . . . . .			
Joseph . . . . .	East End House, Warminster . . . . .	1	0	0
, S. Lee . . . . .	Larkfield, Maidstone . . . . .			
W. . . . .	Sundon House, Clifton Down, Bristol . . . . .	1	0	0
W. H. . . . .	West Newton, Bridgwater . . . . .	1	0	0
lts, E. . . . .	Deanwood, Rivington, near Chorley, Lancashire . . . . .	1	0	0
th, Sir J. H. Greville,	Ashton Court, Bristol . . . . .			
n, W. . . . .	Corscombe, Dorchester . . . . .	1	0	0
Edmund . . . . .	The Quarries, Exeter . . . . .	1	0	0
J. . . . .	Broadclyst, Exeter . . . . .	1	0	0
set, Duke of . . . . .	Maiden Bradley, Bath . . . . .	2	0	0
et Trading Co. . . . .	Bridgwater . . . . .	1	1	0
rville, A. F. . . . .	Dinder House, Wells, Somerset . . . . .			
man, Henry . . . . .	Bath . . . . .			
man, Sir J., Bart. . . .	The Hall, Wem, Salop . . . . .			
W. S. . . . .	Mill Farm, Priston, Bath . . . . .	1	0	0
W., jun. . . . .	Jordans, Ilminster . . . . .	1	1	0
r, J. M. . . . .	Oakhill, Bath . . . . .	1	0	0
r, S. . . . .	Holywell Manor, St. Ives . . . . .	1	0	0
Capt. J. W. Gooch . . .	Spye Park, Chippenham . . . . .	1	0	0
C. . . . .	Manor Farm, Bishops Caundle, Sherborne . . . . .	1	0	0
Joseph . . . . .	High Street, Glastonbury . . . . .	1	0	0
Patent (Limited). . . .	Henry Street, Bermondsey, London . . . . .	1	0	0
ay, Rev. Edward . . . .	Heathfield, Taunton . . . . .	1	0	0
sh, Miss L. . . . .	New Park, Brockenhurst, Hants . . . . .	1	0	0
d, A. . . . .	Eatons, Steyning, Sussex . . . . .	1	1	0
rd, W. . . . .	Eatons, Steyning, Sussex . . . . .			
d, W. H. E. . . . .	Frylands, Henfield, Sussex . . . . .	0	10	0
pe, Hon. and Rev. B. L. S.	Byford Rectory, Hereford . . . . .	1	0	0
y, E. J., M.P. . . . .	Quantock Lodge, Bridgwater . . . . .	2	0	0
R. . . . .	Yelfords, Chagford, Devon . . . . .	1	0	0
, T. . . . .	Heatherton Park, Taunton . . . . .	1	0	0
, Mrs. . . . .	Mitchells, Saffron Walden . . . . .	1	0	0
A. . . . .	Red House Farm, Stratton-on-the-Fosse, Bath . . . . .	1	0	0
ns, Darell . . . . .	Trewornan, Wadebridge, Cornwall . . . . .			

Name.	Residence.	Sub- scriptions.
		£ s. d.
Stevens, R. N. . . . .	Woodham Hall, Woking, Surrey	1 0 0
Stevens, W. . . . .	Budlake, Broad Clyst, Exeter	1 0 0
Still, Henry . . . . .	Addington House, Addington, Croydon . . . . .	1 0 0
Stocker, G. . . . .	High Street, Exeter . . . . .	1 0 0
Stokes, Robert . . . . .	Burroughs Hill, Salisbury . . . . .	1 0 0
Stone, George. . . . .	Camerton, Bath . . . . .	1 0 0
Stone, John S. . . . .	Clarence Place Works, Newport, Mon. . . . .	0 10 0
*Story-Maskelyne, N. . . . .	Basset Down House, Swindon . . . . .	2 2 0
†Strachey, E., M.P. . . . .	Pensford, Somerset . . . . .	
Stratton, Richard . . . . .	The Duffryn, Newport, Mon. . . . .	1 0 0
*Strickland, A. L. . . . .	23, Warwick Square, London, S.W.	2 0 0
Stubs, Peter . . . . .	Blaisdon Hall, Newnham, Glou- cestershire . . . . .	1 0 0
Stuckey, Vincent . . . . .	Hill House, Langport . . . . .	1 0 0
Stuckey, W. J. . . . .	Lambridge Lodge, Bath . . . . .	1 0 0
*Stucley, Sir G. S., Bart. . . . .	Moreton, Bideford . . . . .	2 0 0
Studdy, T. E. . . . .	Leckford Down, Stockbridge . . . . .	1 0 0
Sturge, William . . . . .	Bristol . . . . .	1 1 0
Style, A. F. . . . .	Boxley House, Maidstone . . . . .	1 0 0
Summers, F. B. . . . .	Hagloe House, Blakeney, Glou- cestershire . . . . .	1 0 0
Sutton, John C. . . . .	Shirley, near Southampton . . . . .	1 0 0
*Sutton, M. J. . . . .	Kidmore Grange, Caversham, Oxon . . . . .	2 0 0
*Sutton and Sons . . . . .	(Seedsmen) Reading . . . . .	2 2 0
Swanwick, R. . . . .	College Farm, Cirencester . . . . .	1 0 0
Swayne, W. T. . . . .	Glastonbury . . . . .	1 0 0
Sweet, Rev. L. E. . . . .	The Vicarage, Bathford, Bath . . . . .	1 0 0
Talbot, Miss . . . . .	Margam Park, Port Talbot . . . . .	1 0 0
Tangyes (Limited) . . . . .	Cornwall Works, Birmingham . . . . .	1 0 0
Tanner, E. F. . . . .	Hawson Court, Buckfastleigh . . . . .	1 0 0
Tanner, J. B. . . . .	King's Weston, Shirehampton, Bristol . . . . .	1 0 0
Tapp, David James. . . . .	Knaplock, Winsford, Dulverton . . . . .	1 0 0
Tapp, John . . . . .	Winsford, Dulverton . . . . .	0 10 0
Tasker, W., and Sous . . . . .	Andover . . . . .	1 1 0
Tate, J. A. . . . .	Fairfield, Wells, Somerset . . . . .	1 0 0
Tayleur, C. W. . . . .	Hampton, St. Mary Church, Tor- quay . . . . .	1 0 0
†Taylor, George . . . . .	Crauford, Hounslow, W. . . . .	
†Taylor, H. W. . . . .	Showle Court, Ledbury, Hereford	1 0 0
†Tazewell, W. H. . . . .	Manor House, Taunton St. Mary's	
*Temple, Earl. . . . .	Newton Park, Newton St. Loe . . . . .	2 2 0
Thomas, T. C. . . . .	The Manor, Weston Bampfylde, Sparkford, Bath . . . . .	1 0 0

Name.	Residence.	Subscriptions.
		£ s. d.
W. . . . .	The Beam House, Montford Bridge, Salop . . . . .	1 0 0
on, John . . . . .	Badminton, Chippenham . . . . .	1 1 0
n, Col. White . . . . .	Broomford Manor, Exbourne, N. Devon . . . . .	1 0 0
r, Joseph . . . . .	Thornhill Bridge, Caledonian Road, King's Cross, London, N. . . . .	. . .
J. . . . .	Ringdale House, Faringdon, Berks . . . . .	1 0 0
C. G. . . . .	Curdon Farm, Williton, Somerset . . . . .	1 0 0
J. . . . .	West Yard, N. Molton . . . . .	0 10 0
J. G. . . . .	Horridge, Romansleigh, S. Molton . . . . .	0 10 0
John . . . . .	Bradley, Winsford, Dulverton . . . . .	0 10 0
r, John . . . . .	Corfe Hill, Weymouth . . . . .	1 0 0
D. T. . . . .	Chippenham . . . . .	1 0 0
J. Huntley . . . . .	Alford House, Castle Cary. . . . .	1 1 0
orton, Sir N. W., . . . . .		
e, Lord H. . . . .	Buckland, Faringdon, Berks . . . . .	1 0 0
B. . . . .	Muntham, Worthing . . . . .	2 0 0
D. . . . .	The Park Farm, Thornbury . . . . .	1 0 0
William . . . . .	Morton, Thornbury . . . . .	1 0 0
W. T. S. . . . .	Treworgan, Ross . . . . .	1 0 0
A. . . . .	Quaish Farm, N. Woolton, Shepton Mallet . . . . .	1 0 0
W. and Son . . . . .	Holland Park Dairy, London . . . . .	1 0 0
W. . . . .	Cheese Merchants, Bath . . . . .	1 0 0
ell, John . . . . .	Implement Maker, Warminster . . . . .	1 0 0
ar, Lord . . . . .	Upper Winchendon, Aylesbury . . . . .	1 0 0
ie, James . . . . .	Tredegar Park, Newport, Mon. . . . .	2 2 0
ie, W. K. . . . .	Tregonning, St. Columb Minor, Cornwall . . . . .	1 0 0
ie, W. H. . . . .	Trerice, Newlyn, Grampound Road, Cornwall . . . . .	1 0 0
ayne, John . . . . .	Sherborne, Northleach, Cheltenham . . . . .	1 0 0
, W. T. . . . .	Heligan, St. Austell . . . . .	. . .
n, E. B. Cely . . . . .	Degembris North, Newlyn East, Cornwall . . . . .	0 10 0
Col. Robert . . . . .	Port Town, Taunton . . . . .	1 0 0
, E. R. . . . .	Matford, near Exeter . . . . .	. . .
, Col. . . . .	The Elms, Frome . . . . .	1 1 0
-Chaffyn-Grove, G. . . . .	Huntsham, Bampton, Devon . . . . .	2 2 0
G. H. . . . .	North Coker House, Yeovil . . . . .	. . .
H. B. . . . .	21, Broad Street, Bath . . . . .	1 0 0
R. . . . .	Bath and Somerset Dairy Company (Limited), Bath . . . . .	1 0 0
W. D. . . . .	Bratton Fleming, Barnstaple . . . . .	0 10 0
W. . . . .	74, High Street, Southampton . . . . .	1 0 0
y, C. C. . . . .	Leinthall, Ludlow . . . . .	1 0 0
Brothers . . . . .	Cedars, Wells, Somerset . . . . .	. . .
J. . . . .	Milsom Street, Bath . . . . .	1 0 0
man, A. C. . . . .	Backwell, Bristol . . . . .	1 0 0
	Castlecroft, Wolverhampton . . . . .	1 0 0

Name.	Residence.	Sub- scriptions.
Unite, John . . . . .	291, Edgware Road, London . .	£ s. d. 1 0 0
Unwin, L. . . . .	Tiverton . . . . .	1 0 0
Upham, W. A. . . . .	Batheaston, Bath . . . . .	1 0 0
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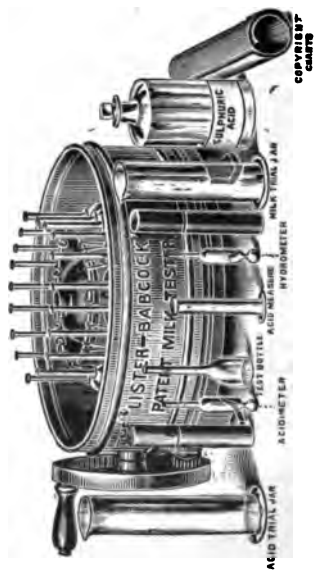
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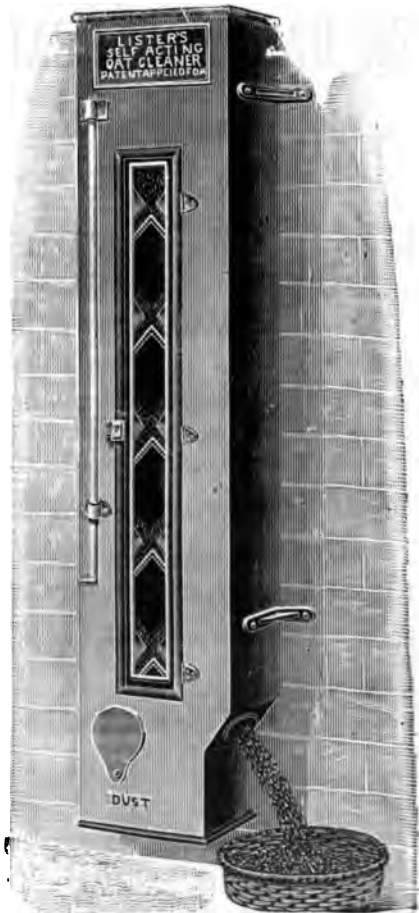
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**THOS. F. PLOWMAN,**

*4, Terrace Walk, .*

*March, 1894.*

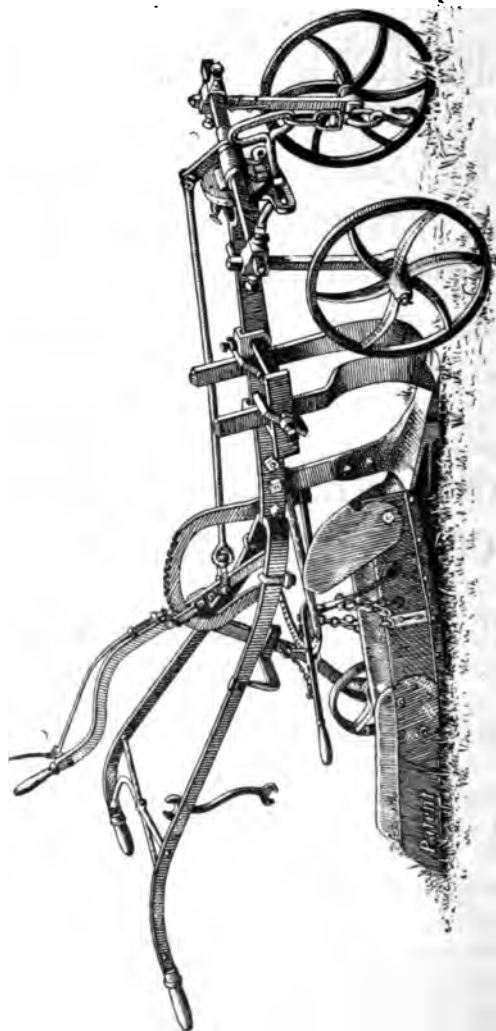
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C. T. D. Acland.**

### THE NOTE-BOOK.

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### THE FARMER'S LIBRARY.

Notes on New Books.

### APPENDIX.

Official Awards of 1892; Prize Lists of 1893; Financial Statements; List of  
Members, &c.

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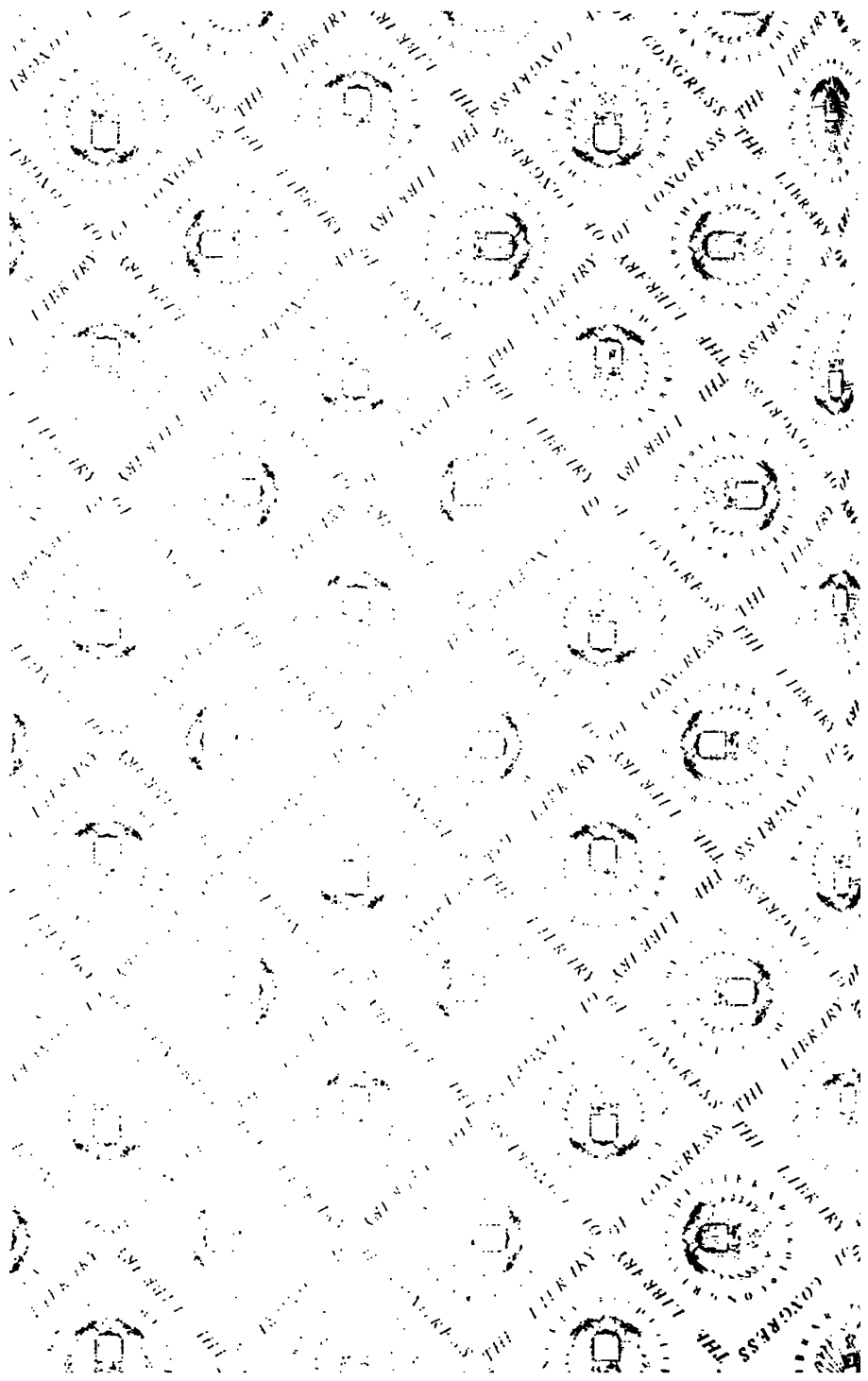
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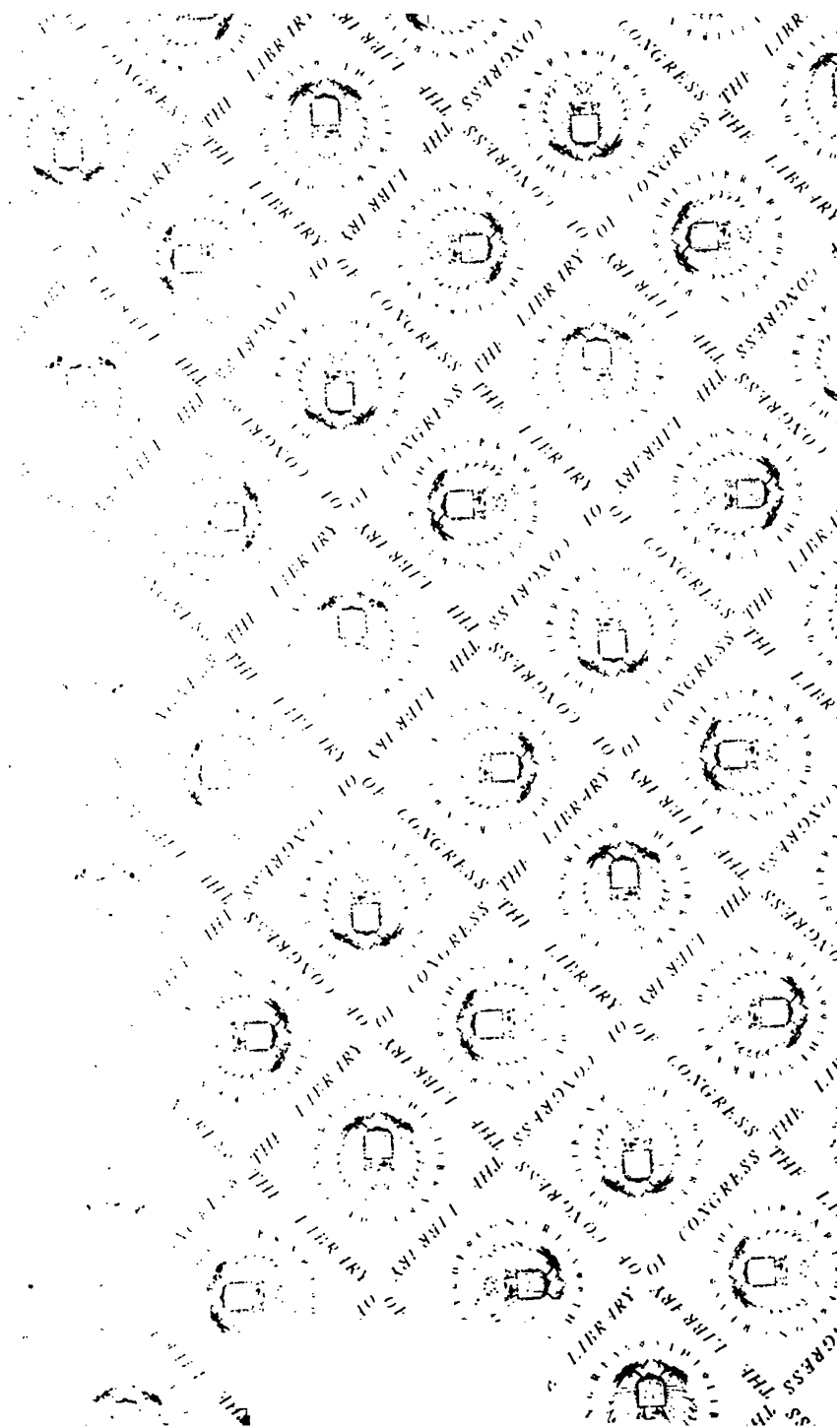
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